DIPARTIMENTO DI SCIENZE AGRARIE ALIMENTARI E AMBIENTALI

MASTER COURSE IN: FOOD AND BEVERAGE INNOVATION AND MANAGEMENT

THE CRAFT BEER REVOLUTION: AN EXPLORATORY ANALYSIS OF CONSUMERS'AND BREWERS' PERCEPTIONS

THESIS TYPE: Experimental

Student:
MICHAEL AUSILI

Supervisor:
PROF. DEBORAH BENTIVOGLIO

ACADEMIC YEAR 2019-2020

To my family, to Eleonora, to my friends
and to all those who have always believed in me.
Thanks for always being there.

INDEX

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ART.	Article
CAP	Common Agricultural Policy
CCV	Cylindro-Conical Vessel
CFU	Colony Forming Units
CIP	Clean In Place
CL	Centilitre
CM	Centimetre
CMO	Common Market Organization
DMD	Date of Minimum Durability
EC	European Community
EU	European Union
G	Glucose
HL	Hectolitres
I.E.	Id Est
IMF	International Monetary Fund
IT	Italy
L	Litre
LAB	Lactic Acid Bacteria
LD	Legislative Decree
M	Meter
MD	Ministerial Decree
N.	Number

N.A.	Not Applicable
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

INTRODUCTION AND THESIS PURPOSE

In the last decades, the beer industry has been affected by a phenomenon called the craft beer renaissance, whose origin dates back in the 1970s in the United States. From the mid of the 1990s craft beers started to spread in the Italian market, mostly in the Northern regions, and from the mid of 2000s the number of microbreweries and the popularity of craft beers boomed across the country, moving from around 160 brewers in 2007 to more than 860 today. Craft beer industry gained great success and credibility. It originated from a movement of people led by passion for beer, and it fast became a real economic business able to find its own place in the beer market, which is traditionally concentrated and dominated by few multinational corporations.

The exponential growth experienced by craft beer benefited from the structure of the actual beer industry whose increasing concentration of generalistic brewers producing a few styles readily available to consumers enhanced the chances of specialist organizations such as craft breweries to survive and be a highly viable and sustainable business strategy able to capitalize on a niche market that macrobrewers were not seeking to address. In particular, the surge in popularity of this beer segment benefited from innovation, creativity, typicality, and authenticity that typify craft beer as an experience delivering drink that offers pleasure, enjoyment, sense of identity and belonging, self-fulfilment, social recognition, and sustainability.

This study aims to analyse the progress of the sector by comparing the point of view of the producers and that of the consumers. The two parties involved are clearly fundamental for the future further development of the craft beer sector and therefore must be understood and studied, in order to be able to predict and be able to modulate the choices to be made from here on to ensure that this growth continues safely and that the entire craft structure is consolidated from year to year more and more. The study is research-based, carried out through the use of two questionnaires aimed at studying the characteristics, preferences, doubts and perplexities in the widest possible way, going from the producer to the consumer, to try to take a picture of the current situation in the world of craft beer. Only through knowledge of the sector at present is it possible to make forecasts and eventually remedy shortages.

The idea of studying this specific sector was dictated by my passion for craft beer in the first place, then strengthened by my Erasmus experience during the master's degree course at the Universiteit Gent in Belgium (house of beer), supported by great enthusiasm from the thesis supervisor Prof. Deborah Bentivoglio.

In this work you will find the research divided into 5 chapters that covered all the main aspects of the world of beer, with a special focus on craft beer. The production, the market, the legislation, the evolution of the sector, the exploratory study results, will be some of all the aspects that we will analyse along these pages.

CHAPTER I
BEER SUPPLY CHAIN

1.1 The origins of beer

A goddess? A woman? Who produced the first beer made up of barley grains and water? The origins of beer are mixed between myth and reality. 15.000 years before our era, after the last glaciation, cereals, yeasts that fermented spontaneously and liquids containing sugars were already known. A legend tells how in a village between the Tigris and the Euphrates rivers, in the land called Mesopotamia, a woman forgot a bowl of cereals outside the hut. It rained, and the cereals got wet. The sun made them sprout, but the sun itself, which became scorching, made the sprouts die. It rained again, and the beans macerated in the water. The microorganisms present in the atmosphere triggered spontaneous fermentation. After a few days an animal drank from the bowl and began to behave strangely. Intrigued, the woman tasted that liquid. The woman felt invigorated and happier. The harshness of life seemed more bearable to her and perhaps she saw divine intervention in this (Turri, 2010).

Considering that the Sumerians lived in Mesopotamia and they were a population that certainly knew the cultivation of cereals and the subsequent transformation of these products into flour and then into bread, this legend may have a background of truth. At that time, the transformation of the cereal into flour took place using stones of support. With wear these stones hollowed out and when it rained the water that stagnated was enriched with the remnants of the grinding of cereals. It is so possible that someone tasted that yellowish water that we can consider as the first beer. It is known from written evidence that the Sumerians commonly called beer “se-bar-bi-sang”, which means “water that makes it clear”, since even then it was an alcoholic drink (Callegari and Zamperetti, 2012).

Beer and bread in the ancient world share an identical path. “Bappir”, barley bread, sings the hymn composed around 1800 BC in honour of Ninkasi, the Sumerian goddess responsible for the fermentation of barley, “bread man” was called the brewer in Egypt, “malt bread” was called by Zosimo from Panopoli, an Alexandrian scholar of the first half of the IV century AD, to whom we owe a very accurate description of the various stages of beer production (Vaccarini, 2015).

Among the first written records on beer, we found Sumerian clay tablets dating back to the IV millennium BC (3300 BC - 3000 BC) which describes the gifts offered to the goddess Nin-Harra: kids, honey and beer. (Turri, 2010) The provenance of these tablets is unknown, they are called The Blau Monuments in honour of Dr. A. Blau an earlier owner who lived for some time in southern Mesopotamia. These tablets are currently displayed at The British Museum in London (Figure 1-1) (The British Museum, 2020).

Figure 1-1: The Blau Monuments (The British Museum, 2020)

Sumerian bakers produced beer flavoured with spices and cinnamon to be distributed in different quantities to citizens. The law set 2 litres per day for workers; to a high priest was guaranteed 5 litres a day. The beer houses were run by women. Barley beer was generally called “sikaru” (liquid bread) but there were various versions that differed in colour, spiciness and gradation. The Sumerians also produced a spelled beer called “kurunnu”, in addition to other highly appreciated types obtained by mixing the first two in different proportions. “Niud” beer was sweetened with dates sugar and the “bi-du”, the people’s beer, was part of the workers' base salary. At that time the beer was turbid and unfiltered, therefore, as some Sumerian clay tablets confirm, it was drunk with a straw to prevent very bitter residues from settling on the lips.

After the fall of the Sumerian empire, in 2000 BC Mesopotamia became the land of the Babylonians who learned the art of brewing beer. They brewed 20 varieties of which 8 of wheat, 8 of barley and 4 derived from a mixture of the other cereals. Hammurabi, King of Babylon, issued during his reign (1792-1750 BC) the oldest known code of laws, the Code of Hammurabi in which he provided in one of its paragraphs, very severe penalties for those who produced or sold watered-down beer (Turri, 2010). Article 108 of the Hammurabi Code stipulated that beer should be sold at the price of barley, and that if a tavern owner applied a surcharge, he would have to be sentenced and thrown into the water. Beer was soon considered

the inspiring muse of grandiose works, so much so that Article 109 of the Hammurabi Code declared that if the owner of a tavern allowed conspirators to gather under his roof without capturing them and bringing them to justice, he had to be sentenced to death (Rissanen and Tahvanainen, 2019).

Beer arrived from Babylon to Egypt, where it was called zythum (barley wine). The Egyptians purified the bodies of their most illustrious dead with a beer-based wash. From childhood they used to get children to drink low-grade beer and during weaning, if the mothers did not have milk, they gave them beer diluted with water and honey. The Ebers papyrus is an 18,63 m long and 30 cm high scroll dating back to the XVIII Pharaohs dynasty also known as medical papyrus. It was purchased in Luxor by Georg Ebers that under advice of the consul, shipped it from El Cairo to, probably, the Saxon minister of state Karl von Gerber. The box shipped contains the largest and most beautiful papyrus which Germany possess, the third largest of all existing ones. It is the oldest and most important medical papyrus of Ancient Egypt. It is currently kept at the library of the University of Leipzig, in Germany (Figure 1-2). It offers more than 600 medical prescriptions whose main ingredient is beer to alleviate the suffering of humanity. About the medical field, it is now known that the Egyptians used to try to predict the sex of a new baby. It was traditional to put barley and wheat in two canvas bags that the pregnant woman would wet every day with her urine. If the barley sprouts first, the baby would be a female; if the wheat sprouts first, the new-born would be a male. If they did not sprout either, she would not give birth. It is surprising to know that only in 1933, J. Manger of the Institute of Pharmacology of the University of Würzburg, shows how the urine of the pregnant woman who will give birth to a male accelerates the growth of wheat, while if she gives birth to a female, her urine will accelerate the barley growth (Turri, 2010; University of Leipzig, 2020).

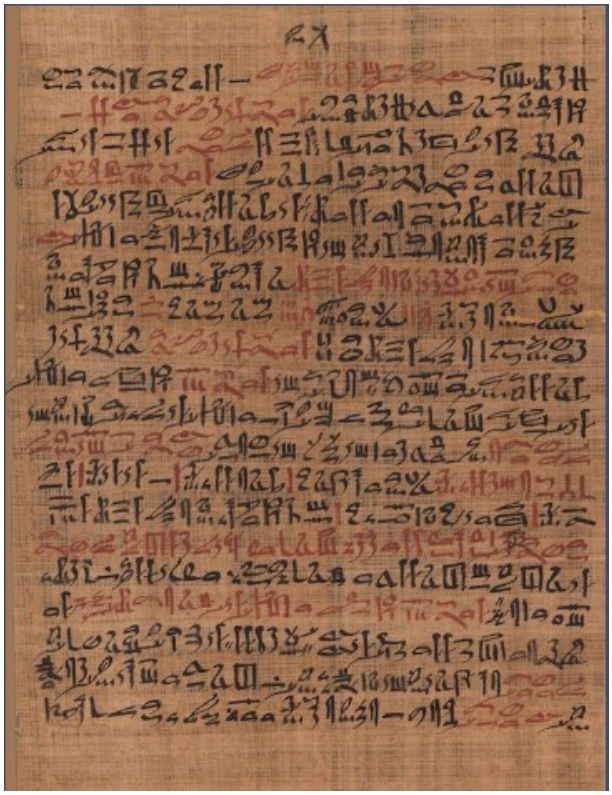

Figure 1-2: Ebers Papyrus: the largest medical scroll of the Ancient Egypt. Column 37/108: gastro-intestinal disorders (University of Leipzig, 2020)

In the European Middle Ages, the use of earthenware pots is abandoned and copper containers were used which give the beer more refined qualities. The set of various aromas, called "gruyt" from a Saxon term, could have been made up of a large number of spices: amber, raspberry, pepper, fennel, lavender, anise, saffron, cinnamon, gentian and cloves. The Crusaders contributed to the increase in the use of spices which, imported from the East, undoubtedly give a superior quality beer (Turri, 2010).

Making beer and bread at home was a custom in the medieval domestic economy also because, when food was scarce, beer, a cereal product, could be a valid substitute; also for this reason, in the Central and Northern regions of Europe, it was customary that all the paraphernalia for making beer was included in the bride's dowry. In an economy poor in exchanges, such as the medieval one, it is clear how self-production played a central role and moreover the production of beer within the domestic walls is explained by the fact that it, beverage-food, is rich in vitamins and proteins, therefore particularly precious in an era of scarcity and frequent famines.

In monasteries, activities like making beer or making wine (in areas of southern Europe) became soon a source of profit and expression of that typical mixture of spirituality and social

life characteristic of this historical phase. The medieval monastery, in fact, was an institution deeply embedded in the social, cultural and productive fabric of society, a very different institution from the one we know today, where, instead, prayer and intimate closeness from God reign over everything. According to the rule of San Benedetto, the slogan that marked the activities in the monasteries was “ora et labora”, that means “pray and work”, so much so that we can consider the medieval monasteries as real companies. Being also training, culture and research centres, the brewing techniques had had all the time to be studied and developed, for this reason, excellent beers began to be produced in monasteries. Beers were used not only for internal use, but also to refresh the wayfarers and therefore sold to those who wish them. It is, in fact, in monasteries that a decisive qualitative leap in beer production took place. Some ingredients were introduced including hops. The inflorescence of hops has glands that produce a yellow and sticky liquid, with a characteristic bitter and aromatic flavour, which also performs an antiseptic and preservative action in beer and makes it clearer. With the definitive rise of hops in the XIII century, the “gruyt” was shelved and given away to history books. With the use of hops, beer takes appearance and taste similar to the beers we drink today. The industry expands consumption until the XVI century. Beer arrives in America in December 1620 on the ships of the Pilgrim Fathers. Then, due to the revolutions and religious wars (from the war of the thirty years very strong taxations came) the consumption reduced dramatically. In 1714 Fahrenheit invented the thermometer and in 1768 M. Marin invented the hydrometer. These tools helped improve the brewing process.

Beer was a state monopoly and beer production, unlike wine, was subject to taxation as an alternative to flour products (obtained from the same raw material). The production quantity was therefore changed year by year, according to the overall needs of the population, based on the abundance or scarcity of the crops. In the Middle Ages and in the modern era, the brewing of beer was prohibited in the years of famine, when all the harvest had to be destined for products of greater food urgency. The industrial and scientific revolutions revolutionized also the world of beer by mechanizing its production and providing the opportunity to strictly control the production process. Mechanization made possible to increase the production quantity. The first steam brewing machine is attributed to James Watt in 1785. Daniel Wheeler in 1817 patented a malt-roasting machine. Jean-Louis Baudelot invented a must cooler in 1856. The artificial chilling of Carl von Linde made possible to produce beer in summer. Previously, refrigeration was carried out only with the use of large blocks of ice or by placing the containers in naturally cold cells. The discovery of yeast as an essential ingredient for brewing and the work of Louis Pasteur, French chemist and biologist, on fermentation opened

the way to understanding the action of yeast and that of the bacteria responsible for the problems leading with bad taste. Many producers such as Gabriel Sedlmayer, master brewer owner of Spaten, and the Viennese Anton Dreher, started up scientific research laboratories. The yeast studies allowed the production of low fermentation beer. This discovery coincided with the epidemic caused by the phylloxera which destroyed vineyards throughout Europe in the late XIX century. In this context, beer consumption grew exponentially. The innovation of the XX century in the preparation and packaging of beer, the social media, the emergence and development of mass marketing, however, cause a flattening due to the little differentiation within the beer market (Turri, 2010; Vaccarini, 2015).

Despite everything, it is in XX century that begins the history of the brewing industry which today sees few multinationals that dominate an increasingly globalized beer market including Carlsberg, Heineken, AB-Inbev and SAB Miller that are located in the European Union. Today the EU is one of the main world areas of beer production with his about 406 million hl produced in 2018 and more than 10.000 breweries. The growing interest of consumers and the standardization of the product due to the strong industrialization suffered, led to the birth of microbreweries. Today in the EU there are about 8000 microbreweries and have the aim and the passion to bring back to the market ancient tastes and flavours that have been lost with the large-scale industry (The Brewers of Europe, 2019).

1.2 Raw materials

Beer is a natural alcoholic beverage obtained from four fundamental raw materials universally used: water, malt, yeast and hops.

Malt

First of all, it is essential to clarify and distinguish between barley and malt. Barley, common name of the genus *Hordeum*, belonging to the Graminaceae family (Figure 1-3), is a cereal that grows well at almost all latitudes and is rich in enzymes capable of activating the transformation of starches into sugars (Turri, 2010). These characteristics have made it, over the centuries, the most used cereal for making beer as we know it today, while corn and rice are the most common substitutes, often preferred because of the lower cost. Wheat, spelled, rye, oats and others are instead used to confer particularly refined characteristics. In Italy it is possible to use up to 40% of substitutes (Billia *et al.*, 2009). At different latitudes of the world,

the types of cereals mainly used may also be different, such as rice in Asia, corn in America, sorghum in Africa, spelled, rye, oats and millet in Sub-Saharan Africa (Vaccarini, 2015).

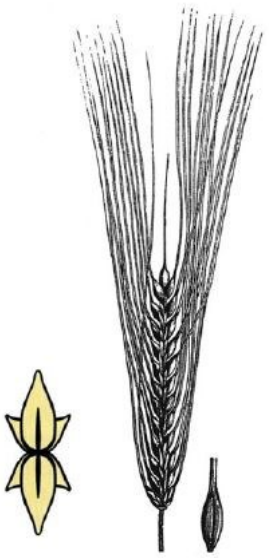

Figure 1-3: Top and side view of Couplet barley, the most used one for the production of beer; it has two rows of seeds (kernels) on each cornstalk (Mosher, 2013)

Malt, on the other hand, is the product of the malting of barley, wheat or other cereals. The malting consists in a first phase of maceration of the barley grains in water, followed by a germination, during which the enzymes that break up the starch to make it transformable into sugars are activated, and a subsequent drying, or roasting, which it is generally obtained with the circulation of hot air. The different duration of this last phase and a variable temperature regulation give rise to different coloured malts measurable on a scale ranging from 2.5 (pale Pils malts), to over 1000 (roasted malts) with all intermediate variables. At the same time, beer can have colours that depend almost exclusively on the type of malt used, and a few percentage points of roasted malt mixed with a pale Pils malt are enough to obtain a very dark, almost black tint (Billia *et al.*, 2009). The colour of the malt is measured in degrees on the basis of the EBC (European Brewery Convention) scale. The higher the value, the darker the beer (Rissanen and Tahvanainen, 2019). From a gustatory and olfactory point of view, malt is the main responsible for the sweet, honey and caramel taste. It is used in a range between 100 kg and 500 kg per 1.000 litres of must according to the desired result. To increase the final alcohol content, the quantity of malt has to be high because is the malt, which contains sugars, that is the substrate for the alcoholic fermentation. Malt is essential for stabilizing and preparing subsequent biochemical transformations of beer. This is a procedure that is carried out in large factories, generally linked to industrial groups, often to the detriment of craft beer producers.

In fact, the latter have difficulty in obtaining specific processes, even on locally grown barley, as large malthouses tend to produce only the types required by the industry (Billia *et al.*, 2009).

Hop

Hops (Humulus lupulus) is an annual climbing herbaceous plant dioecious, now grown in all temperate areas and capable of reaching heights of 4-6 meters. As an ingredient in beer, the cone-shaped flowers of fine and fragrant female plants are used, while male shrubs are eradicated to prevent fertilization and therefore the production of seeds (Turri, 2010). After harvesting, hops are dried and reduced to powder, to then be compressed into tablets called pellets. These inflorescences are rich in lupulin, which contains resinous substances called "iso-α-acids", such as humulone and lupulone: these give the beer its characteristic bitter taste by carrying out an important work of compensation for the sweetness made from the malt. In addition, they have antibacterial, disinfectant, antioxidant properties and favour the persistence of the foam. Hops are also rich in essential oils, responsible for the fragrance and aromas of beer; precisely on the basis of the proportion of iso-α-acids and essential oils, which determines bitter and aromatic qualities of different grades, the numerous varieties of the plant are identified, which will have therefore different roles in the preparation of the beer: some will be used for the specific bitter contribution, others for the aromatic one. Hops are therefore crucial in the production of beer. Knowing with precision the varieties (over 50 overall) is fundamental to understand the origin of many of the olfactory-gustatory sensations detected during the tasting (Billia *et al.*, 2009). The quality of the hops is distinguished by its origin. For example, hops for Pilsner which comes from a certain region of the Czech Republic have a delicate aroma and are particularly suitable for this type of beer, but fine hops are also found in Hallertau and Hersbruck in Bavaria as well as there are characteristic hops which come from Siberia, Kent in England, Belgium, Alsace, Yakima in the United States and again from New Zealand or Japan. In Table 1-1 is possible to have an overview of the characteristics of the most important types of hops. They are generally added to the must when boiling, as with high temperatures the α-acids isomerize. This means that while maintaining the same composition, they change shape to iso-α-acids: in other words, hops are soluble with boiling. In general, the percentage used is very low and is around 1 kg per 1.000 litres of must, but typically bitter beers like Pils are produced by adopting higher proportions (Billia *et al.*, 2009). The hop varieties are distinguished from each other essentially by the aromatic characteristics which can be assessed on the basis of the essential oils contained in them and the α-acids content. Aromatic hops are commonly called "noble" hops even if the origin in this case is very

important, only hops that come from a certain region or area can be considered noble. Bitter hops contain an α-acids percentage of more than 6%. Usually they are added at the beginning of the boiling. Aromatic hops contain less than 5% α-acids and are usually added at the end of boiling. Hops used for both aromatic and bitter purposes have a good percentage of α-acids between 6 and 8%, but despite this they are also able to release an intense aroma (Vaccarini, 2015).

Table 1-1: Characteristics of the most important types of hops (Billia *et al.*, 2009)

Name	**% α-acids**	**Origin**	**Characteristics**
Styrian Goldings	3-6	Belgium	Citrus and bitter flavours
Fuggle	2-5	Czech Republic	Typical of Czech Pils, herbaceous and delicate
Hallertau Hersbucker	2-5	Germany	Delicate and fruity, ideal for Lagers and finely hopped Ale
Hallertau Magnum	9-14	Germany	Traditional bitter of German beers
Perle	5-9	Germany	Similar to Hallertau Hersbucker but higher % of α-acids
E.K. Goldings	5-7	UK	Traditional variety, delicate and spicy aroma
Fuggle	3-7	UK	Traditional, with scents of mown grass and mint
Target	8-13	UK	Excellent bitter hop, very low astringency
Amarillo	7-11	USA	Unique aroma, spices, mandarin, used both for bitterness and aroma.
Cascade	4-7	USA	Typical aroma of USA beers, grapefruit aromas, good bitterness
Columbus	13-18	USA	High level of α-acids, suitable for bitterness. Often used to be added at the end of boiling.

To quantify the degree of bitterness imparted to beer by hops, a particular unit of measurement called IBU (International Bitterness Unity) is used which calculates the percentage of iso-α-acids present in beer. The higher the value, the stronger the hopping and, consequently, the greater the bitterness (Billia *et al.*, 2009; Rissanen and Tahvanainen, 2019).

Yeast

Yeast is a microorganism, more precisely a mushroom, which feeds itself with substances it finds in the environment in which it lives and has always been widely used in food preparations such as in wine, bread, cheese. The fermentation of the must takes place through the action of the yeast, which characterizes the beer in its taste and alcohol content. The yeasts used for beer are of two different types and their diversity is responsible for the classification of beers, introduced from the Danish Emil Christian Hanses, into two large families: high fermentation beers and low fermentation beers. Top-fermenting yeasts (they float on the surface of the beer) produce higher concentrations of alcohol and prefer higher temperatures (Turri, 2010). *Saccharomyces cerevisiae* is the typical yeast used for high fermentation beers. It is a yeast that does not require a low temperature to trigger fermentation, which can already take place between 10 °C and 20 °C. For this reason, until the discovery of the refrigerator, it was also the most used type of yeast as it was able to produce a beer that could be produced during the whole year and not only in the cold season. *S. cerevisiae* is widely used to produce traditional English beers such as Ale, with a dry and bitter taste like Stout and Porter, Belgian Ale in the Saison and Trappiste type, Belgian white beers but also Berliner Weisse and Weizen.

Bottom-fermenting yeasts (they settle on the bottom of the fermentation tank) transform a greater quantity of sugars and work well at low temperatures. Among these, *Saccharomyces carlsbergensis*, isolated by Emil Christian Hanses at the end of the XIX century, ferments between 5 °C and 10 °C. The low fermentation temperature makes this yeast suitable for producing a more stable beer because the low temperatures prevent the proliferation of other microorganisms that could damage the beer. The spread of low fermentation beers was favoured by the invention of the refrigerator by the German engineer Carl Paul Gottfried von Linde at the end of the XIX century, as before the most favourable winter months had to be waited for controlling the fermentation process. *S. carlsbergensis* was discovered in Denmark in the late 1800s in the laboratory of the Carlsberg factory. Despite its relatively recent introduction, it is the most used strain, as it is normally used in the production of Lagers, the most popular and well-known beers in the world. Low fermentation dry yeast is in fact suitable for Pils and Lager beers (Billia *et al.*, 2009; Vaccarini, 2015).

Since yeast is a microorganism present everywhere, even in the air, beer can also be made without resorting to the use of selected yeasts, since it is in the air itself that the must receive the yeast which triggers fermentation. This is the case for spontaneously fermentation beers. Belgian beers, such as Lambic and Gueuze, are produced in this way. However, it is a system that is very sensitive to external influences, therefore also to the presence of pollutants and other microorganisms that could infect beer, causing off aromas and off flavours. Lambic type beer is a beer produced in a very limited geographical area, in the Siene river valley in Brussels and in the southwest side of the city. There are barely a dozen producers of this type of traditional beer. The hop used in Lambic beers has undergone two or three years of aging and has therefore lost its incisiveness. The generous hopping does not give Lambic a bitter taste, rather it improves its conservative qualities. After boiling, the must is cooled in shallow tanks in the basement of the breweries. Traditionally, the attic windows are left open so that the microbial apparatus of the valley can enter, carried by the wind. Finally, the must with its "wild" yeasts is transferred into wooden barrels, where the fermentation of beer, depending on the desired result, can last from a few months up to three years. Gueuze beer is born from the assembly of two or more Lambic of different ages which continue their fermentation even in the bottle (Vaccarini, 2015; Rissanen and Tahvanainen, 2019).

Water

Water constitutes 85-90% of the beer, the remaining part is made up of the other ingredients listed so far. The breweries have made the choice of water a cornerstone of the quality of their production and, for this reason, the factories were born near sources of pure water where it is abundant in quantity and constant in quality. The choice of water is in fact fundamental for the quality of the beer. Rainwater rich in carbon dioxide (CO_2), dissolves the salts it encounters, it is rich in calcium and magnesium carbonates, which make the beer less soft in flavour, as its alkalinity reduces the organic acids brought in by the malt. Sulphates or chlorides present in the water give the beer a better quality of flavour. It is very important to establish the hardness of the water. In the case of carbonates, we speak of temporary hardness, since with the boiling these salts are eliminated crystallizing on the surface of the container. With the other mineral salts, we speak instead of permanent hardness, as they remain dissolved in the water even at boiling temperature. The total hardness, instead, represents the grams of calcium and magnesium dissolved in a litre of water. The most suitable waters for beer production are the poorest in carbonates (Turri, 2010). The hardness of the water is expressed in degrees and the notation varies from country to country. The notation most commonly used in the brewing

sector is the German grade (°D or ° DH) and 1°D corresponds to 10 mg/l of CaO^{14}, but the French grade (°F), the British grade (°GB) and the American degree (°USA) are also used. Based on their hardness, the waters can be classified as:

- Sweets (0-10 °D)
- Medium (10-20 °D)
- Hard (over 20 °D) (Gresser, 2010)

In table 1-2, an overview of the typical composition of water used for beer production with relative characteristics of its components is shown. Today, thanks to the knowledge gained in the chemical field, if the available water does not correspond to the desired characteristics, it is possible to "correct" the water used in breweries in order to select the desired substances and make them available in the right quantity, eliminating the unwanted ones (Gresser, 2010; Idriss *et al.*, 2015). Sweet waters with low calcium carbonate content are ideal for producing Lager and Pils, the medium water for English-style Ale, while hard water is suitable for dark and stout beers (Turri, 2010).

Table 1-2: Composition of water for brewing beer and its characteristics (Idriss *et al.*, 2015)

Parameter	Unit of measurement	Target	Effect on process
Bicarbonates	mL HCl 0,1 N / 100 ml	< 2,0	Avoid calcium precipitation with risk of oxalates
Total hardness	°DH	8,0-12,0	Hard water contributes negatively to drinkability
pH	pH	6,0 – 7,5	Low pH: -Improves the yield of raw materials -Less extraction of tannins and bitter substances from hops
Calcium	mg/l	40 - 60	Affects yeast flocculation
Magnesium	mg/l	10 – 20	In excess causes bitterness in combination with sulphates
Sodium	mg/l	< 150	"Sweet palate"
Sulphates	mg/l	200-400	Positively affect taste roundness
Chlorides	mg/l	< 150	Gives body

1.3 Production process

The quality of the raw materials, as widely discussed, is fundamental for the production of a good beer, but subsequently also the production process and its efficiency are clearly very important. The total process in shown in Figure 1-4 and the brewing steps can be grouped as follows: malting, grinding, mashing (saccharification), cooking and hopping, fermentation, maturation, pasteurization, packaging and labelling.

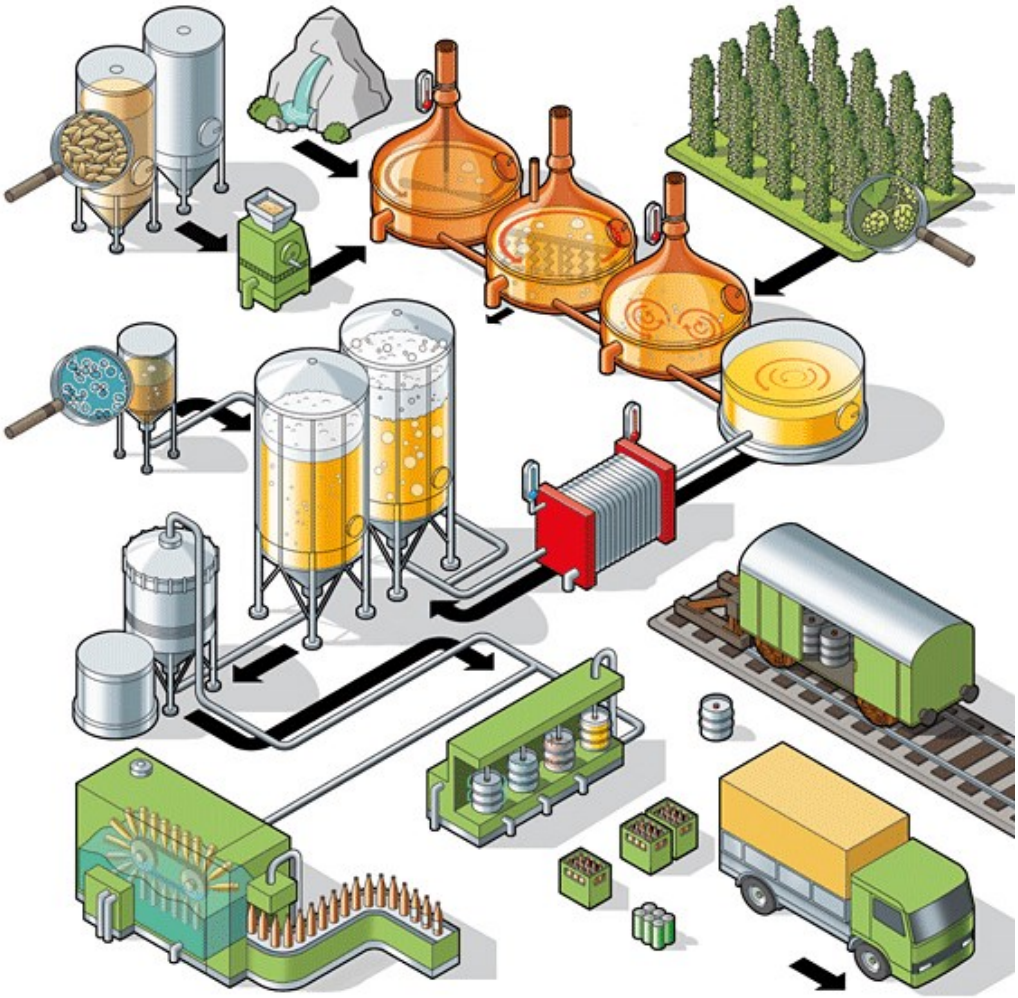

Figure 1-4: Beer supply chain (Pilatusbrau website, 2020)

1.3.1 Malting

As described at the beginning of paragraph 1.2, the malting process consists, thanks to the hydration of the seed, in inducing the germination of the cereal which is subsequently interrupted by means of a drying heat treatment. The aims of the process are mainly of

technological nature and are represented by the production of amylolytic and proteolytic enzymes, that are absent in non-germinated barley, whose action is indispensable during the mashing phase to hydrolyse the starch of the malt. The drying, in addition to the removal of the water, leads to the formation of compounds that contribute - together with the type of malt used, the roasting times and the temperature - to the colour and the characteristic aroma of the different malts. The last processing after roasting involves cooling the malt and removing the rootlet. To obtain a final humidity of 4%, and therefore a stable and storable malt for a few months, the malt is subjected to the so-called "fire stroke" during which the temperature reaches about 80-85 °C (pale malts). By definition, all malts other than pale Pilsner malt (basic malt), or obtained from cereals other than barley, are special malts. Special malts are generally classified into three categories which can be listed in increasing colour order, namely dark malts, caramel malts and roasted malts. The difference between dark malt and caramel malt lies in the fact that the latter undergo a saccharification process (the hydrolysis of starch by amylolytic enzymes) within a single caryopsis. The use of these malts allows to obtain beers with a more intense malt aroma. Instead, the roasted malts of which the best-known examples are Chocolate and Black, are obtained from finished pale malt subjected to a drum roasting process. During this phase the temperature can exceed 200 °C (Turri, 2010; Idriss *et al.*, 2015).

1.3.2 Grinding

Grinding is the first operation that takes place in the brewery (as mentioned above, malting operations take generally place in large malthouses linked to industrial breweries). Before mashing, the malt is subjected to grinding by means of mills. This phase is very important because the degree of crushing of the malt, as well as the grain size of the flour and the greater or lesser integrity of the seed rind, condition both the yield of the extract during the mashing phase and the effectiveness of filtering the must (which occurs, in fact, using the spent grain as a filtering panel). A very fine grinding favours the action of enzymes during mashing and allows optimal extraction. However, this can cause a slowing down of the process following the filling of the false bottom of the filtering tank; vice versa, a very coarse grinding avoids packing phenomena during filtration, but resulting in a lower extraction yield and therefore a lower malt yield (Idriss *et al.*, 2015). Grinding is carried out using with roller mills or hammer mills. Roller mills are the most used and can have 2, 4, 5 or 6 rollers. The rollers work in pairs, at the same speed or at different speeds, and the gap between the pairs of rollers is adjustable so as to adapt to malts of different sizes. Today, two- and four-roller mills are used only in micro-breweries and brewpubs for economic reasons, while industrial breweries use complex

systems with six-roller mills, which allow wider choice for brewers (Briggs *et al.*, 2004). To consider a grinding satisfactory, it is essential that no a single grain remain intact: this would in fact indicate errors in the calibre of the rollers or malfunctions of the system. Furthermore, modern laser arc control devices are spreading which guarantee precise, reliable and very rapid results (Gresser, 2010).

1.3.3 Mashing

The mashing step consists in mixing the grounded malt with hot water to solubilize and extract the greatest possible quantity of substances (therefore called "extract"), and in heating the mixture up to the temperatures that allow enzymes to catalyse reactions. Each enzyme exerts maximum catabolic activity at specific pH and temperature values (optimum), therefore the control of these factors during mashing is essential; however it is good to keep in mind that the enzymes are also active at pH and temperature values far from the optimum, so it is possible to look for a compromise solution. This can be achieved by selecting a single mashing temperature that allows to obtain a must with a good ratio between fermentable and non-fermentable sugars (for example, 65 °C), or by providing "stops" at different temperatures.
The main enzymes involved in mashing are α-amylases and β-amylases, responsible for the degradation of starch; proteases, responsible for protein degradation; β-glucanases which degrade β-glucans and the phytases which allow to reduce the pH of the must. Stops are carried out at 45-55 °C for the formation of peptides and amino acids, at 60- 65 °C for the action of β-amylases and at 70-75 °C for that of α-amylases, amylolytic enzymes which hydrolyse the starch lead respectively to the formation of fermentable maltose (G-G) and maltotriose (G-G-G), and non-fermentable dextrins ($G_{5\text{-}30}$). Proteases, by degrading proteins, significantly increase the amount of free amino acids, fundamental elements for the proper functioning of yeasts. However, it is necessary to control their action because an excessive protein depletion causes instability of the foam and therefore a significant lowering of the quality of the final product. The optimum temperature for protease activity is at about 50 °C, but the use of well-modified malts allows today to avoid the proteolytic stop (first stop). Phytases, by degrading the insoluble phytin salt, allow to lower the pH of the must; however, modern methods of water correction make it possible to avoid also the so-called acid stop. β-glucanases are instead indispensable for the degradation of β-glucans, that due to their high viscosity cause turbidity and filtration problems. As mentioned, the activity of enzymes is linked to both the temperature and the pH of the must. To decide the pH level to keep in the mashing phase, it is usually considered that the most relevant reactions are those related to the degradation of the

starch, so the pH must be maintained in the optimum levels for amylases (5,2 - 5,8). Sometimes, it could be necessary to correct the insufficient acidity of the mixture, for example adding acid malt, lactic acid, chloride or calcium phosphate in order to ensure quick enzymatic reactions (Buiatti, 2004; Idriss *et al.*, 2015).

After the breakdown of the starch into sugars, the liquid fraction of the must have to be separated from the solid fraction (threshing) to obtain a liquid must. The choice of the filtration system is mainly dictated by the grinding method previously adopted, but sometimes it is still tied to tradition. The most used instruments are the mash tun (mixing-filtering tank), the lauter tun (filtering tank) and the membrane mash filter (filter-press). At the end of the filtration, threshes are washed, dried and sold to the livestock industry for feeding livestock (Leiper and Miedl, 2006).

1.3.4 Cooking and hopping

At the end of the filtration, the must is cooked and during this phase the hop is added to the mass. With high temperatures, the must undergoes various transformations including:

- Sterilization: all bacteria that could damage the fermenting beer are eliminated; enzymes and microorganisms are inactivated;
- Concentration: excess water evaporates. The evaporation factor is a fundamental index of the chemical-physical processes that occur during boiling. The hourly evaporation factors commonly used are of the order of 4,0-6,0%;
- Solubilization of the bitter compounds of hops: the bitter substances of hops isomerize (on average only a third of the total α-acids is transformed);
- Clot and flocculation of proteins: proteins and polyphenolic compounds coagulate; given that the polyphenols are partially present in an oxidized form and that the proteins have different molecular weight, during boiling compounds with different properties are formed, including oxidised proteins and insoluble polyphenols;
- Decrease in the pH of the must: determined both by the supply of acidic substances by the hop and the formation of melanoidins;
- Increase of the colour intensity: Maillard reaction between free amino and hydroxyl groups of sugars that generate the compounds called melanoidins, which contribute to darkening the must (Turri, 2010; Idriss *et al.*, 2015).

Barley malt can be added with raw grains and other sugary sources, for example syrups. Hops are added in the form of pellets or extract and are only rarely used as dried hops (Briggs *et al.*, 2004). The addition of hops must be carried out taking into account several factors including

the number of “ranges”, the time and the order in which add the different hops. These parameters depend on the type of beer and brewing technique: hops can be added in a single range or divided into parts (up to four). For the production of slightly bitter (20-24 IBU) and finely hopped beers, hops are usually added in a single range within 20 minutes from the start of boiling. If, on the other hand, hops are added in two ranges, 70-80% is added within 10-20 minutes from the start of boiling and the remaining part within 10 minutes from the end of boiling. Generally, the bitter hops are added first in order to maximize the isomerization of the α-acids, while the aromatic hops are added towards the end of cooking to preserve their essential oils in the finished beer. Late additions in the cooking vat or even in the Whirlpool separators (explained in details later) confer a strongly hopped aroma; the addition of pellets, powder or hop extracts in the ripening vat allows to obtain even more intense but often not very stable hop aromas (Leiper and Miedl, 2006). The cooking lasts on average from one to two hours (Gresser, 2010). At the end of the boiling, if the hops have been used as they are, the must is recirculated in a double bottom vat (hop back) through a bed of exhausted hops until it becomes clear; hops in pellets and extracts of hops do not form this filter bed, so the must is clarified in special centrifuges.

Modern centrifuges allow to separate up to 95% of the must turbidity. This system uses the different densities of liquids and solids to separate them and the process is speeded up by the action of the centrifugal force. Although the system is effective, centrifuges are systems with high operating and maintenance costs and the advent of the Whirlpool system has almost completely supplanted them. Whirlpool separators can be considered as modified centrifuges: this clarification tool is a cylindrical container having a slightly inclined flat bottom, in which the must is introduced tangentially at high speed in order to favour a swirling motion that leads to the separation of the turbid through his collection in the centre, on the bottom of the container. The process lasts 20-30 minutes, after which the must is cooled. The Whirlpool has become the preferred separation system due to its simplicity and reliability and has as its only disadvantage a certain lack of flexibility (Leiper and Miedl, 2006).

1.3.5 Fermentation

Subsequently, at the end of the clarification, the must is sent to the fermentation vat and along the way refrigerated using heat exchangers in order to bring it to the temperature suitable for the inoculation of the yeast. This temperature varies according to the type of fermentation adopted: for low fermentation it cools down to 6-12 °C, while for high fermentation at 15-25 °C. Cooling should be conducted quickly and under aseptic conditions to stop all chemical

reactions and avoid bacterial contamination (Briggs *et al.*, 2004). The quantity of yeast added to the must varies from brewery to brewery, but it usually settles on about 10 million live cells per millimetre of must at 12 °P (Plato degree -°P- means the quantity in grams of dry extract contained in 100 grams of the must from which the beer is derived; the sugar richness thus obtained is rounded to one tenth of a degree, neglecting the fractions of a degree equal to or less than 5 cents, and calculating for a tenth of a degree those higher) (*LD n. 504*, 1995). The effective quantity, however, depends on several factors including the fermentation temperature and the selected yeast strain (Munroe, 2006). The cooled must is then aerated or oxygenated to allow the yeast to multiply. It is important to note that this is the only phase in which the must is deliberately enriched with oxygen, in all other production phases oxygenation is considered extremely negative due to the deleterious effects of oxidation reactions on beer. Oxygen is consumed quickly (6-10 hours), the yeast cells grow in number producing energy, CO_2 and ethylene (toxic for cells). The increase in the concentration of alcohol and the reduction of fermentable sugars determine the entry into the stationary phase (cells do not increase in number) in which the yeast begins the flocculation process (Briggs *et al.*, 2004; Buiatti, 2004; Munroe, 2006). Flocculation is the ability of yeast to clump together. It is an important and desirable characteristic unique to brewer's yeast, as it helps them to ride to the top or sink to the bottom of the fermentation tank. Near the end of fermentation, single cells aggregate into clumps of thousands of cells. Different strains have different flocculation characteristics. Some strains flocculate earlier and tend not to attenuate as much, while others do not flocculate as readily and tend to attenuate more. Flocculating too early tends to result in a beer that is under attenuated and sweet. However, when yeast fail to flocculate entirely, it results in a beer that is cloudy with a yeasty taste (White and Zainasheff, 2010).

Fermentation is one of the fundamental steps in beer production and the conditions in which it is carried out have a decisive influence on the taste of the finished beer. The secondary products of yeast metabolism influence their taste and the concentration of these products depends on the fermentation conditions. To maintain constant the quality of the beer, it is therefore essential to keep constant the optimal conditions for the fermentation (Buiatti, 2004). In order to do this, proper monitoring systems and equipment are used. The most important measurements to taking into account during fermentation - in order of precedence - are temperature, specific gravity, pH, oxygen and CO_2. The metabolism of yeast cells requires the presence of nitrogen, carbon sources, vitamins and several key minerals such as phosphorus, sulphur, copper, iron, zinc, potassium, calcium and sodium. In beer must, fermentable sugars represent the main source of carbon, while free amino acids are a source of nitrogen. The

biochemical process that allows yeast cells to produce energy from the metabolism of sugars in an anaerobic environment take the name of alcoholic fermentation, term coined by Louis Pasteur in the 1860s. One of the most important things yeast produce for fermented beverages is alcohol. The overall equation that describes this process is the following:

Glucose + 2 ADP + 2 phosphate → 2 ethanol + 2 CO_2 + 2 ATP (White and Zainasheff, 2010; Mozzon *et al.*, 2015).

Fermentation is carried out in closed horizontal or vertical tanks, which differ from one to another in design and function. The most frequently used model is the CCV (Cylindro-Conical Vessel) (Figure 1-5). The conical cylinder tank can be used both for primary fermentation and for secondary fermentation (maturation), since the yeast can be removed from the conical bottom of the container in which it settles, without having to move the beer. The system offers numerous other advantages including ease of CO_2 collection, greater temperature control, less exposure to bacterial contamination and the possibility of using CIP (Clean-In-Place) systems for cleaning operations, thus eliminating manual cleaning. The CCV are filled from the bottom, there are various sizes, but in any case, a head space equal to 25% of the total volume must be considered to allow the formation of the typical fermentation foam. Finally, the shape of the fermentation tanks is very important because it favours or slows the spontaneous convective motions that allow the mixing of the mass and determine the fermentation times (fermentation in horizontal tanks usually requires longer times than that carried out in vertical tanks) (Munroe, 2006).

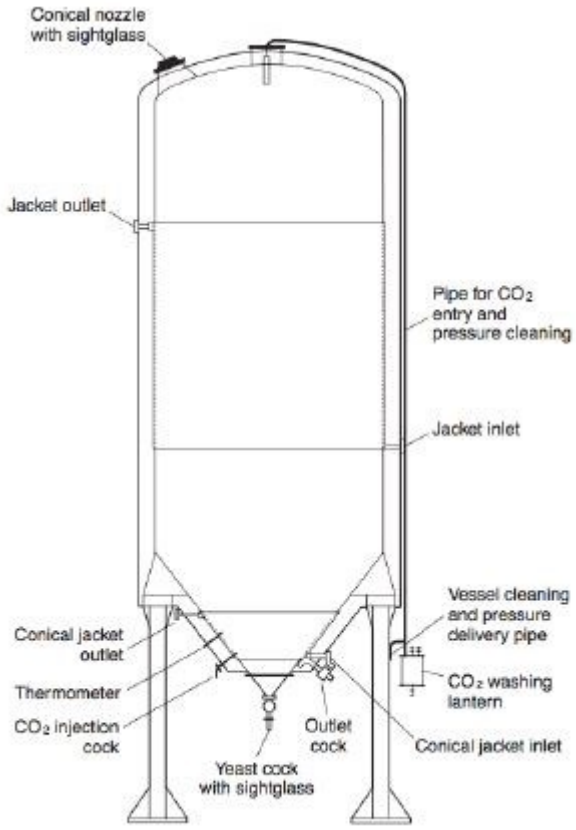

Figure 1-5: CCV type fermentation tank (Briggs *et al.*, 2004)

The final product of primary fermentation is commonly called “green beer” or “young beer”, as it still has organoleptic and biochemical characteristics that make it unsuitable for distribution on the market. For this reason, before being packaged, it must be subjected to various processes that refine its taste and aroma and correct its turbidity.

1.3.6 Maturation

The maturation process (or secondary fermentation) takes place in closed containers inside the brewery called maturation tanks for a duration of one or two weeks. In the past, this had taken several weeks or even months. The maturation carried out with the traditional method involves a secondary fermentation by the yeast still dissolved in the beer after the transfer from the fermentation tank. This yeast uses fermentable carbohydrates not broken down during primary fermentation, or small quantities of added fermentable sugars (priming sugars). Alternatively, it is possible to add a fraction of must still rich in extract and yeast. The CO_2 produced during maturation is essential for obtaining a good beer, however secondary

fermentation also produces other volatile substances that are harmful for the flavour, which is why gradual releases of pressure are done in order to allow the volatilization of these off-flavours. Several important groups of compounds have been identified as changing during the maturation step with consequent positive effect on beer flavours including diketones (especially diacetyl), sulphur compounds, aldehydes and volatile fatty acids. CO_2 is a beer component not to underestimate; it is a fundamental component of beer. The sparkling character and flavour of the beer depend on it. For this reason, the concentration of carbon dioxide is carefully controlled and natural carbonation, the result of primary and secondary fermentation, can possibly be supported by forced carbonation, which consists in adding CO_2 before the final filtration. The optimal level of CO_2 in the finished beer vary from 0,45% in the case of kegs and 0,5% in the case of bottles packaging.

Equipment used for the secondary fermentation is similar to that of fermenting vessels. With the Unitank fermenter (Figure 1-6), fermentation and subsequent maturation could even occur in the same tank. In this case, the size is very important to taking into account. This relates to the hydrostatic pressure on the yeast during fermentation and a generally acceptable height for a fermenter is not greater than 15 m. In a purpose-built maturation tank, there is no such restriction and tanks up to 30 m and even 40 m in height exist. Size usually relates to brewery throughput and lengths. A rule of thumb is that the size should be equivalent to a half-day production, larger tanks take too long to fill and will contain beers of variable age and hence potentially variable final flavours (Briggs *et al.*, 2004).

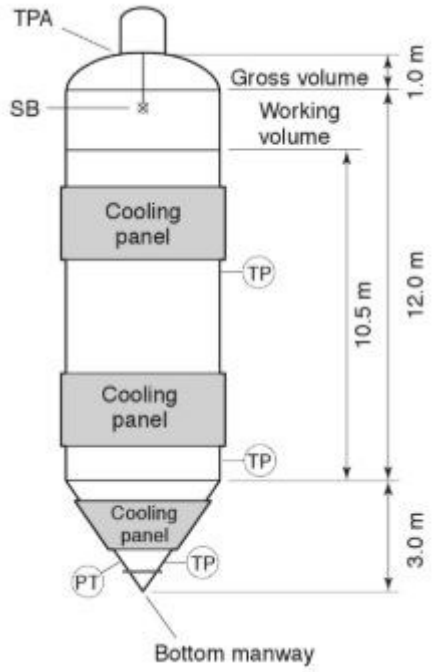

Figure 1-6: Unitank, dual-purpose fermenting tank (Briggs *et al.*, 2004)

Changes in the taste and aroma of beer that take place during this phase are fundamental for the development of the character of the beer and constitute the most easily identifiable characteristic by the consumer, helping to determine the identity of the brand. For this reason, it is essential that these parameters remain stable from this moment until the moment of consumption, otherwise the efforts made up to this point in creating the desired flavour of the beer would be in vain. As anticipated, in addition to having an immature taste, green beer is cloudy and maturation allows clarification. Natural clarification occurs spontaneously thanks to the sedimentation of the tannin-protein complexes at low temperatures (-1 °C), but in modern breweries the process is assisted and speeded up by chemical and technological processes. Clarification is followed by the stabilization process, aimed at ensuring that the beer retains its organoleptic properties until the moment of consumption. During the maturation it is also possible to change the colour and the aroma of the beer; to obtain this result, caramel additions and hop extracts are usually used. Before being subjected to packaging, the beer is finally filtered. Pasteurization, on the other hand, can precede or follow packaging. Sedimentation and centrifugation operations can be considered as preliminary in order to increase the efficiency of the final filtration. Filtration remains the process that ends with the final clarification of the beer and the achievement of the standards required for sale (Briggs *et al.*, 2004). Sterilizing filtration is a special type of filtration that takes place thanks to the use

of filters with very dense membranes (0,45μ) and is usually carried out for beer which will be packaged in kegs, as an alternative to pasteurization. This type of filtration allows to maintain a "fresh beer" flavour and prevents beer from undergoing changes in taste as a result of the thermal shock to which it would be subjected during pasteurization (Briggs *et al.*, 2004; Buiatti, 2004).

1.3.7 Pasteurization

In order for beer to be marketed, it is essential that it is microbiologically safe for consumers. To ensure this, it must come from a plant in which sterilizing filtration has been carried out or in which the beer has been pasteurized. Pasteurization is based on the destruction of all the vegetative bacterial components present in a solution through heat. As anticipated, it is possible to sterilize the beer before or after having packed it. The two different types of pasteurization are distinguished in flash pasteurization and tunnel pasteurization. The first is carried out by heating the beer with a heat exchanger before packaging, and is used for beer that will be packed in kegs, as an alternative to sterilizing filtration. The second is performed on the beer already bottled and corked and is carried out by spraying the bottles with hot water. Tunnel pasteurization is certainly the safest method for obtaining product sterility, however it is about twice as expensive as flash pasteurization and about 5 times more than sterilizing filtration (Briggs *et al.*, 2004; Buiatti, 2004).

1.3.8 Packaging and labelling

Beer can be putted into a number of packages: bottles, cans, kegs and casks, depending on the final destination. Packaging is the most labour-intensive part of the brewing process; capital employed in packaging is usually the highest of the brewing operations. The equipment for packaging beer has become progressively more complex with the object of reducing labour and costs and preserving product quality. The efficiency of operation of packaging machinery is of critical importance to a profitable brewery. Packaging line design vary depending on the type of package, the require rate of packaging and the type of beer to be packaged, but also any eventual secondary packaging needs. Modern small-pack beer fillers (bottles, cans) operates at very high rates, bottling at over 1.000 bottles per minutes and canning at 2.000 cans per minute. As there is little storage space in breweries for empty bottles and cans, a constant stream of these packages to the site is needed. This could mean dozens of vehicles 24h/24h carrying empty containers to the brewery. For this reason, packages manufacturers

are frequently located near the packaging plant. If the beer is flash pasteurized or sterile filtered, then the subsequent operations must be aseptic. Normally there is a system for CIP that is naturally more rigorous when sterile filling is being used. The whole filling operation must not add more than 0,02 mg/l dissolved oxygen to the beer. Contamination of the beer must be avoided; a successful bottling line should ensure that the beer supplied to the consumer do not contain viable microorganisms and that it operates with the minimum number of stoppages to keep losses under 1,5% of the total brewery losses. In order to satisfy the criteria above, it must operate, on a given run of product, continuously.

Labelling is another important operation at the end of the beer production process. The label is of major significative in the presentation of the brand, communicates with the consumer and especially in the case of international beer brands, also conveys an imagine associated with advertising that adds to the overall appeal of the brand. The application and the quality of the label must be of the highest standards; poor quality or poorly applied labels will imply a low-quality beer. Every bottle has at least one label, but frequently more than one is applied. These can be applied to the body of the bottle, to the back and even in the neck. Label also serves to show legislative information required in the country in which the beer is being sold (Briggs *et al.*, 2004). According to (*Regulation (EU)1169/2011*, 2011) concerning the provision of food information to consumers, mandatory information that must be showed are:

- Sales description
- Alcohol percentage (if greater than 1,2%)
- Any allergens contained
- Production lot
- Expiration date (DMD)
- The trademark, name or company name of the manufacturer or packer
- Nominal volume
- The headquarters of the production plant

Different type of label paper can be used including paper, metallized paper and aluminium foil. Modern labelling machines are able to label up to 60.000 bottles per hour.

1.4 Definitions

It is now important to define four different brewery concepts that will be recurring from here on of the whole text: microbreweries, brewpubs, beerfirm and agricultural breweries. Microbreweries are defined as organizations that provide that the same entity takes care of the entire production process, starting or not from the malting of barley, up to the packaging of the product in the formats useful for its destination on the market. Law n. 154 of 2016 specifies the maximum size of the production facilities by setting it at a limit of 200.000 hectolitres per year. Brewpubs identifies those production activities that manage the entire supply chain activity up to the final consumer, in premises managed directly by the production company, mainly but not exclusively with unpackaged product. Here too, the company can buy the malt or can produce it, just as it can market its production not entirely through its premises. Beerfirms are companies without their own brewing plant, that produce their beers using the plants of other craft breweries, with or without their own recipe. The fourth and final differentiation of the market is represented by agricultural breweries. These breweries have the characteristic of producing their beer with raw materials produced for at least 51% by the company itself. Even in the field of agricultural breweries it is possible to have the same forms of articulation of the supply chain with the different levels of integration seen so far. It is possible to have companies with their own production facilities, or in other cases, agricultural beer firms, with companies that grows their own barley and delegates the beer production process to an external plant. In both cases, the agricultural brewery may or may not carry out direct product administration on the plant (Table 2-1) (McGowan, 1997; Swinnen, 2011; Menghini, 2016).

Table 1-3: Summary of the 4 types of craft breweries (our elaboration)

Microbrewery	Production without serving beer
Brewpub	Beer production is supported by a pub or restaurant service
Beerfirm	Beer production is delegated (totally or partially) to another brewery
Agricultural brewery	Beer production made with at least 51% of barley grown on the farm

CHAPTER II
THE BEER MARKET: AN OVERVIEW

2.1 A brief history of the beer market

Alcohol has historically, and continues to, hold an important role in social engagement and social bonding; drinking with friends or moderate alcohol consumption for many is pleasurable. According to WHO, 2 billion people worldwide consume alcoholic beverages. From the XIX to the XX century, up to the First World War, world beer production has grown considerably thanks to countries such as Germany, UK and USA which produced a total amount of product between 5 and 7 billion litres per year. From 1915 to 1950, total beer production slowed sharply both in the old and in the new continent. In Europe, due to the two World Wars and in the United States due to the birth of the Temperance Movement, a social movement against the consumption of alcoholic beverages which obtained by law the ban on any drink with an alcoholic content above 0,5%.

From the 1950s onwards, beer production started to grow again, accompanied by a strong concentration of industry, a phenomenon that had already manifested itself at the beginning of the century. The damage caused by the two wars favoured multiple extraordinary operations between European companies. In particular, mergers and acquisitions proved to be useful in raising the capital needed to build new (and more modern) systems for brewing beer. In the context of the continuous expansion of the brewing market, from 1980 onwards, the beer sector constantly strengthened both on the national and international scene, benefiting of an increase in turnover. An example is the US company Anheuser-Busch, which in 1995 acquired several licenses to be able to produce in the United Kingdom and China. The idea of penetrating the foreign market was pursued by numerous other companies in the sector such as the Dutch Heineken, SABMiller (obtained from the merger of the South African SAB and the second largest brewery in the United States, Miller) and Interbrew (Belgium) which acquired breweries in Eastern European countries, thus expanding its range of action also in North and South America. In 2004, the Interbrew and AmBev companies (Brasil) merged and then, in 2008, carried out a similar operation with the American company Anheuser-Busch. The result of this double merger was the Anheuser-Busch InBev (AB-InBev) group, based in Leuven

(Belgium), to date the world's leading beer producer with a market share of 29,8% following the millionaire union that took place in October 2016 with the British company SAB Miller. This last union creating the largest beer conglomerate in the world valued at over 104 billion US dollars. This newly-formed company will control almost one third of global beer production, with annual sales of 55 billion US dollars (Figure 2-1) (*The Barth Report*, 2014; *The Barth Report*, 2019; Smith *et al.*, 2017).

Ranking	Brewery	Country	Beer output 2018 in mill. hl	Share of world beer production
1	AB InBev	Belgium	567.0	29.8 %
2	Heineken	Netherlands	233.8	12.3 %
3	China Res. Snow Breweries	China	121.0	6.4 %
4	Carlsberg	Denmark	112.3	5.9 %
5	Molson Coors	USA/Canada	96.6	5.1 %
6	Tsingtao Brewery Group	China	80.3	4.2 %
7	Asahi	Japan	57.9	3.0 %
8	BGI / Groupe Castel	France	40.5	2.1 %
9	Yanjing	China	38.0	2.0 %
10	Efes Group	Turkey	31.8	1.7 %

Figure 2-1: World's top 10 brewing groups at 31st December 2018 (The Barth Report, 2019)

In recent years, AB-InBev has acquired, among others, Goose Island in the United States; Cervejaria Colorado, the first craft producers in Brazil; Bogotá Beer Company, the biggest craft brewery in Colombia; the well-known Italian craft producer, Birra del Borgo; and the Belgian Bosteels brewery, a seventh-generation small family brewery and producer of award-winning Tripel Karmeliet. These acquisitions, in addition to several others, created a substantial portfolio of specialty beers in AB-InBev's "craft and specialty beer network". More recently, in 2017, Heineken took over Lagunitas Brewing Company and declared that it would be expanding this brand into the world's first global craft brand. Not surprisingly, these acquisitions have been criticized quite heavily by remaining craft brewers and consumers, who often consider such acquisitions to be a departure from craft origins. Consumer backlash may be one of the largest threats to the takeover spree. Most craft breweries start off small and serve a small group of local customers. In order to grow they need to find access to customers through retailers and/or bars. This can be difficult if industrial breweries use their ties with bars and wholesalers to prevent craft beer sales because they create competition for their own beers and because they accuse the crafts of "free riding" on their infrastructure investments. Industrial breweries have used their control over bars and retailers to push their own beers, including a growing list of own (formerly) craft beers. For example, in the United States, most beer wholesaling is done by distributors who concentrate either on brands in the AB-InBev or

in the MillerCoors portfolio. Most wholesalers that are authorized to distribute either AB-InBev or MillerCoors products also distribute craft beer, but AB-InBev recently announced a plan that would incentivize some of its distributors to focus on the sale of AB-InBev brands (Garavaglia and Swinnen, 2017).

2.2 European scenario

Today, in the European international scenario (EU-28), the United Kingdom is the country with the largest numbers of breweries (2.250) followed by Germany, France and Italy with respectively 1.408, 950 and 873 breweries, microbreweries included. From 2010 to 2016, in most European countries, the number of active breweries has grown significantly everywhere (+175%), with the exception of Germany which registered only + 6% unlike UK (+172%), Italy (+146) and France (+145%) (Figure 2-2).

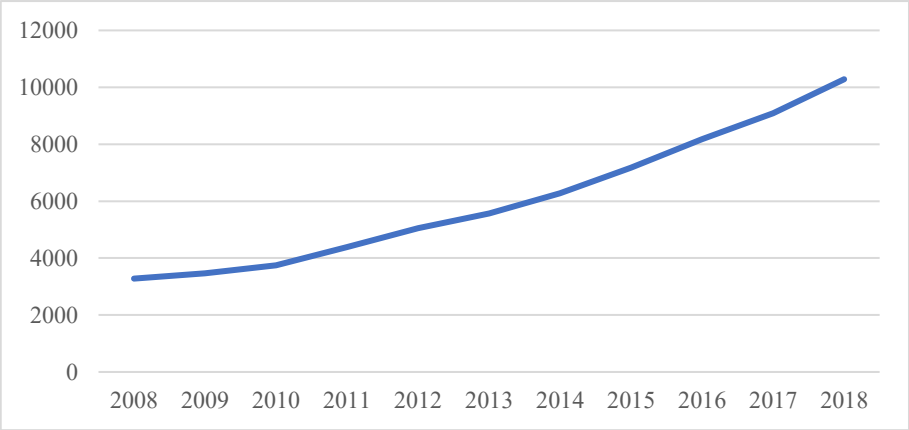

Figure 2-2: Trend of active breweries in the decade 2008-2018 among EU-28 countries (number of active breweries) (our elaboration on data The Brewers of Europe, 2014 and 2019)

In the decade 2008-2018, beer consumption in EU-28 starting to decline from the year 2008 in which 378 million hl was consumed until the lower consumption in 2013 corresponding to 350 million hl. From that point, beer consumption among EU-28 countries start to grow again arriving to 370 million hl consumed in 2018 (Figure 2-3). From 2017 to 2018, beer consumption in EU-28 increase by 2,9%.

European leader in beer consumption in 2018 was Germany with 84,6 million hl consumed, almost one fourth of the total beer consumed in EU-28 (23%) followed by the 48,6 million hl

of the United Kingdom (13% of the total EU-28), 39,9 million hl of Spain (11%) and 38,4 million hl of Poland (10%) (The Brewers of Europe, 2014, 2019).

Czech Republic had the higher value of beer consumption per capita with its 137 litres followed by Austria (105), Germany (101) and Poland (97) (AssoBirra, 2018).

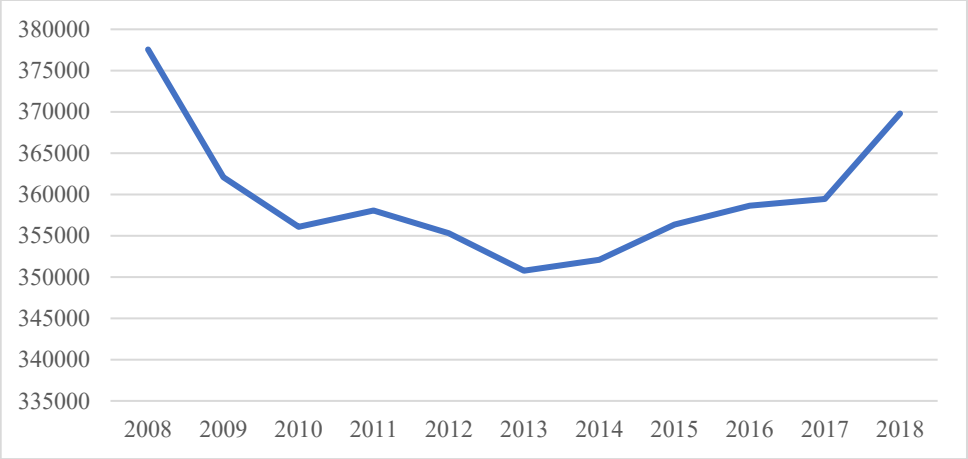

Figure 2-3: Beer consumption trend in the decade 2008-2018 among EU-28 countries (in 1.000 hl) (our elaboration on data The Brewers of Europe, 2014 and 2019)

About the place of consumption, the supremacy of home consumption (off-trade) over consumption outside home (on-trade) in EU-28 countries is shown in Table 2-1. On-trade percentage of consumption is greater only in countries like Greece, Ireland, Malta, Portugal and Spain, while is rather in equilibrium with off-trade consumption in Luxembourg and UK. Trends of on/off-trade consumption are more or less stable within each country from 2012 to 2018.

Table 2-1: European countries on-trade and off-trade (in %) (The Brewers of Europe, 2019)

	2012		2013		2014		2015		2016		2017		2018	
Country	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off
Austria	32	68	32	68	29	71	28	72	29	71	28	72	28	72
Belgium	46	54	45	55	45	55	44	56	44	56	43	57	42	58
Bulgaria	25	75	23	77	20	80	22	78	20	80	20	80	20	80
Croatia	35	65	36	64	39	61	40	60	40	60	40	60	40	60
Cyprus	42	58	40	60	42	58	42	58	42	58	51	49	55	45
Czech Republic	43	57	41	59	41	59	40	60	39	61	38	62	36	64
Denmark	25	75	25	75	25	75	23	77	23	77	25	75	23	77
Estonia	9	91	9	91	9	91	8	92	8	92	7	93	7	93
Finland	15	85	15	85	15	85	15	85	14	86	13	87	12	88
France	23	77	21	79	20	80	20	80	20	80	20	80	20	80
Germany	19	81	19	81	19	81	19	81	18	82	18	82	18	82
Greece	56	44	56	44	55	45	57	43	59	41	59	41	61	39
Hungary	38	62	35	65	35	65	35	65	35	65	35	65	30	70
Ireland	61	39	64	36	64	36	67	33	66	34	65	35	64	36
Italy	42	58	41	59	41	59	40	60	39	61	38	62	36	64
Latvia	8	92	9	91	10	90	10	90	10	90	10	90	N/A	N/A
Lithuania	8	92	8	92	10	90	9	91	10	90	N/A	N/A	N/A	N/A
Luxembourg	52	48	52	48	51	49	49	51	48	52	47	53	45	55
Malta	62	38	60	40	60	40	60	40	65	35	64	36	64	36
Netherlands	27	73	25	75	35	65	35	65	35	65	34	66	34	66
Poland	10	90	10	90	15	85	15	85	15	85	15	85	14	86
Portugal	68	33	63	37	64	36	63	37	63	37	69	31	69	31
Romania	22	78	19	81	18	82	18	82	16	84	15	85	15	85
Slovakia	37	63	36	64	34	66	33	67	31	69	29	71	29	71
Slovenia	40	60	40	60	40	60	40	60	40	60	40	60	35	65
Spain	63	37	62	38	63	37	64	36	62	38	63	37	67	33
Sweden	20	80	20	80	20	80	21	79	21	79	21	79	20	80
United Kingdom	53	47	51	49	50	50	49	51	48	52	47	53	46	54

In the decade 2008-2018, beer production among EU-28 countries follow the trend seen in beer consumption. From the 408 million hl of the 2008, beer production decline until 386 million hl in 2013 to rise again to about 405 million in 2018 (+5%). The ranking by producing countries sees Germany in first place with a production of 83 million hl (equal to 21% of the total EU production) followed by the United Kingdom (45 million hl produced, 11%), Poland (40 million hl, 10%), Spain (36 million hl, 9%), the Netherlands (24 million hl, 6%) and Belgium (24 million hl, 6 %). Two-thirds of the beer containing alcohol produced in the EU came from these six Member State. In addition, in 2018 the EU produced over 10 million hl of beer which contained less than 0,5% alcohol or had no alcohol content at all. EU-28 beer production increases of 2,5% from 2017 to 2018, which represent only the final part of a curve

that has been growing continuously since 2013 (+5,1%) (Figure 2-4) (The Brewers of Europe, 2014, 2019; Eurostat, 2019a).

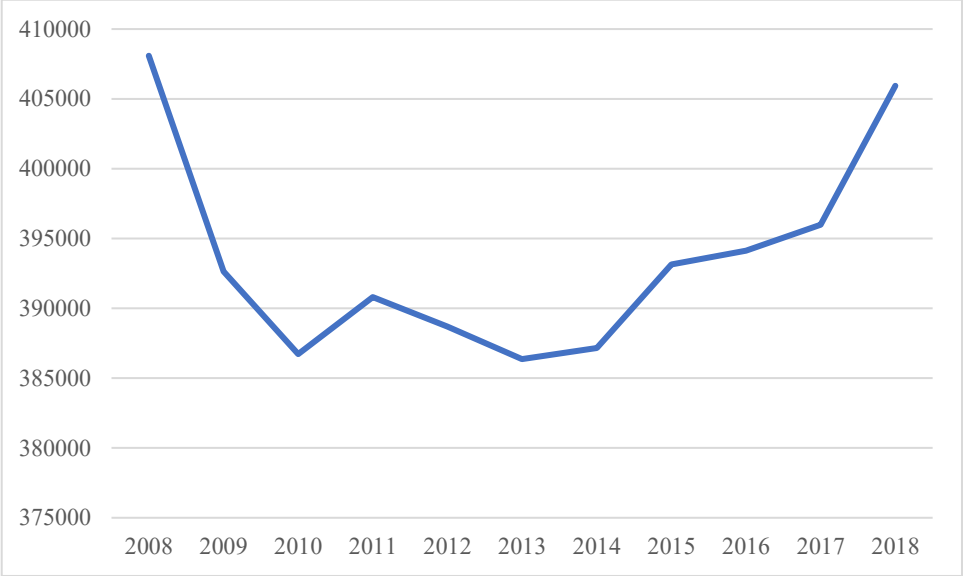

Figure 2-4: Beer production trend in the decade 2008-2018 among EU-28 countries (in 1.000 hl) (our elaboration on data The Brewers of Europe, 2014 and 2019)

As for packaging, both in Europe and in the rest of the world, the most popular packaging is the bottle. The bottles can be returnable or non-returnable. The most used method worldwide is that of returnable although in the developed markets of Europe (and United States of America) the non-returnable method is the prevalent one. Packaging is also influenced by environmental issues, which are stronger in some countries that others. In some cases, a revival in the use of returnable glass bottles and the outlawing of selling beer in cans has occurred. Most countries today have packaging legislation which seeks to control the use of packaging material and to reduce wastes (Briggs *et al.*, 2004).

Regarding the international beer market, both the import and export of beer increased in the decade 2008-2018 as can be seen from Figure 2-5. Total EU-28 export continuously grown from 2009 to 2018 marking a +39% in this period, while total import continuously grown from 2010 to 2018 by +24%. The Netherlands, with 19 million hl of beer, was the largest beer exporter (intra and extra-EU) of all EU Member States, ahead of Belgium and Germany (both 16 million hl), followed by France (6 million hl) and the United Kingdom (5 million hl) (Eurostat, 2019a). United Kingdom and Germany are the EU-28 Member States that import more beer with respectively 10 million hl and 7,2 million hl (The Brewers of Europe, 2019).

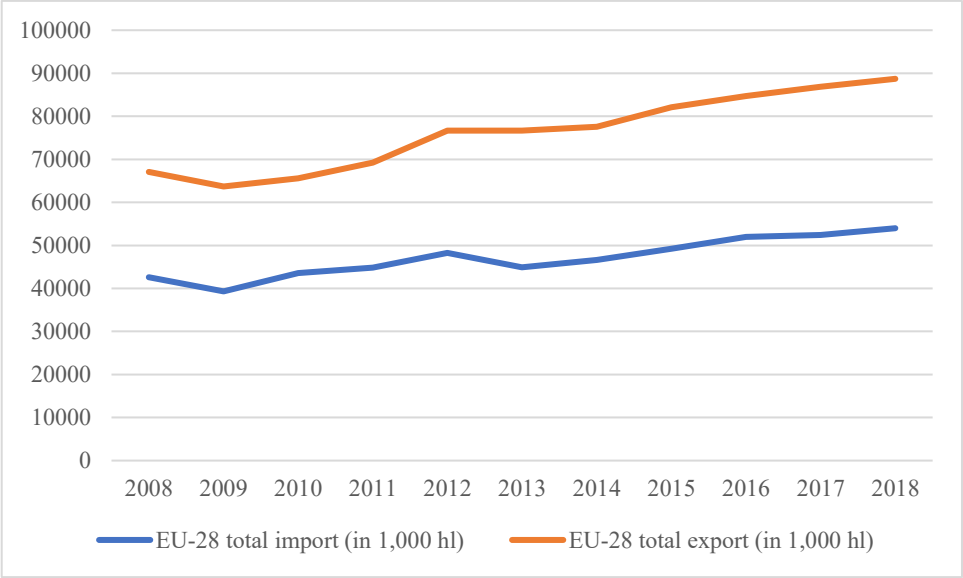

Figure 2-5: Total import and export trends in the decade 2008-2018 in EU-28 (our elaboration on data The Brewers of Europe, 2014 and 2019)

According to a research carried out by Eurostat, in 2018, the price of alcoholic beverages across European Union (EU-28) countries and the 3 EFTA (European Free Trade Association) countries (Iceland, Norway and Switzerland), was more than twice as high in the most expensive Member State than in the cheapest one. In Figure 2-6, price levels in countries are compared with the EU average price level index of 100, the results show that, the price of alcoholic beverages (spirits, wine and beer) was highest in Finland (with a price level index of 182), followed by Ireland (177) and Sweden (152). In contrast, the price levels for alcoholic drinks were lowest in Bulgaria and Romania (both with a price level index of 74) followed by Hungary (77) (Eurostat, 2019b).

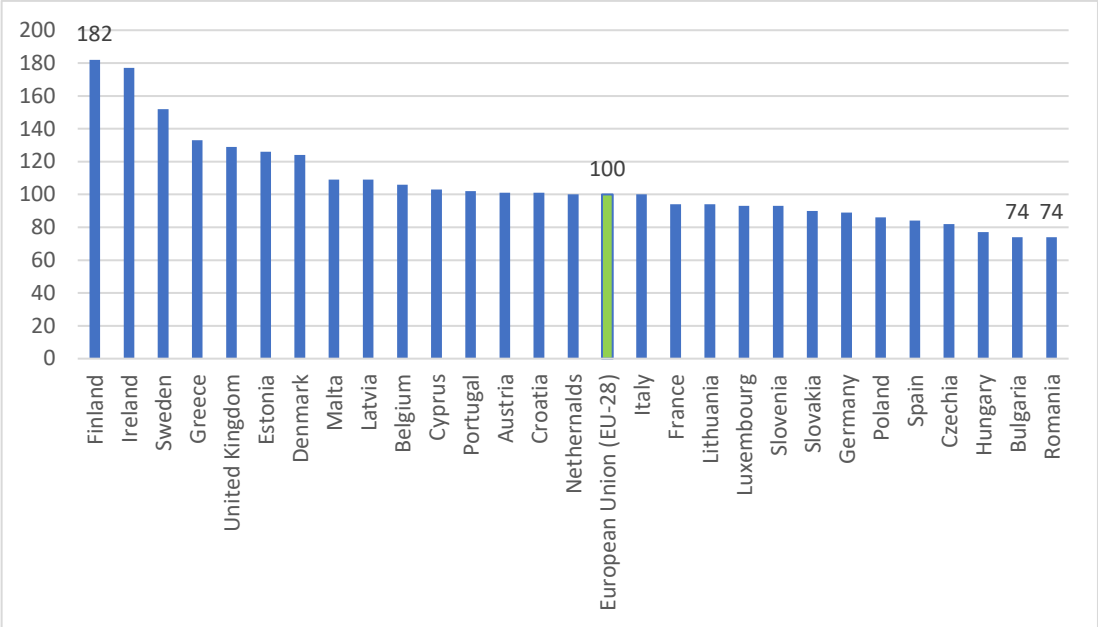

Figure 2-6: Consumer price levels for alcoholic beverages (2018) (Eurostat, 2019b)

A schematic summary of the European market scenario is available in Table 2-2.

Table 2-2: European leader in EU-28 market in 2018 (our elaboration)

Topic	**European leader in 2018**
Number of breweries	United Kingdom (2.250)
Beer consumption	Germany (84,6 million hl)
Beer consumption per capita	Czech Republic (137 l)
Beer production	Germany (83 million hl)
Export	Netherlands (19 million hl)
Import	United Kingdom (10 million hl)
More expensive beer	Finland (price level index 182/100)
Cheapest beer	Bulgaria / Romania (price level index 74/100)

2.3 Italian scenario

Italy has never been a country known for the production of beer: there are certainly national brands that have become very popular over time (although almost all have been acquired, over the years, by international producers) but they were ideally based on the great German and

Austrian brewing tradition. The first Italian factories were born on the initiative of entrepreneurs from across the Alps (Dreher, Wührer, Paskowski, Metzger, Von Wünster etc.), which was followed by Italian merchants, mostly of ice who saw the completion of their business in beer. The first brewery opened within national borders was the Wührer (absorbed in 1988 by Peroni), whose plant was built in Brescia (at that time city of the Lombard-Veneto Kingdom) in 1829, and which , during the 1900s, it absorbed other minor Italian brands such as the Carlo Paszkowski factory, the "Fabbriche Riunite Birra Ronzani and Bologna", the "L.E.O.N.E. Beer" and the "Sempione Beer". The second brewery born in Italy, in 1837, was the Zimmermann in Valle d'Aosta Region, which in the second post-war period of the last century was sold to another company (Faranda Group) and then entered, in 1973, under the orbit of the Henninger Bräu brand in Frankfurt and, from 1987 onwards, in that of Heineken. The beer then became famous with the name "Menabrea", founded in 1846 in Biella (Piedmont), it has been owned by the Forst group since 1991 (the latter born in 1857 near Merano (South Tyrol), it is currently the largest independent Italian producer, not being part of it of any multinational company in the sector). Peroni, the best known and most popular brand in Italy (together with Moretti), was founded in 1845 in Vigevano in Lombardy (to later move to Rome). Over the years, this important Italian brand acquired Carbone Beer, Cioci Beer, Livorno Beer, Dormisch Brewery, Faramia Beer, Itala Pilsen Beer and Raffo Beer. Pursuing a dimensional growth strategy, the company also entered into commercial agreements with the multinational Heineken (oriented towards the purchase of Wührer), which allowed it to penetrate the American market. However, in 2003, the Peroni brand was sold to the international giant SABMiller. The other widespread and well-known brand in Italy is Moretti Beer, owned by Heineken, whose brewery was founded in 1859 in Udine (Friuli-Venezia-Giulia). Italy, alongside the most well-known breweries, hosts other historic brands that must be mentioned: Dreher Beer in Trieste (even if the factory is no longer in the Italian city since in 1978 it was closed following the acquisition of the brand by Heineken), the Lombard Poretti Beer (since 2002 acquired by the Danish group Carlsberg) and the Pedavena from Belluno (of which the multinational Heineken, which became the owner, had closed production in 2004, but then be restored in the 2006 following the purchase of Pedavena by Castello Beer Spa of Udine). As can be seen from this brief historical excursus regarding the main breweries in the history of Italy, in recent decades the growth of the Italian market has attracted the interest of the major world brewing groups (Heineken, SABMiller, Anheuser Busch InBev, Carlsberg), favouring the entry of foreign capital, with acquisitions that concerned the majority or substantial shareholdings of different brands. Investments that have

contributed to the further development and rationalization of production assets, ensuring continuity in the history of prestigious brands and greatly improving productivity. In 2018 there was 873 active breweries in Italy, including industrial (11) and craft breweries (862). The evolution about the number of active breweries in Italy is available in Figure 2-7. It must be said that the highly positive trend (+297%) is primarily due to craft breweries. We will explore the topic later on Chapter IV.

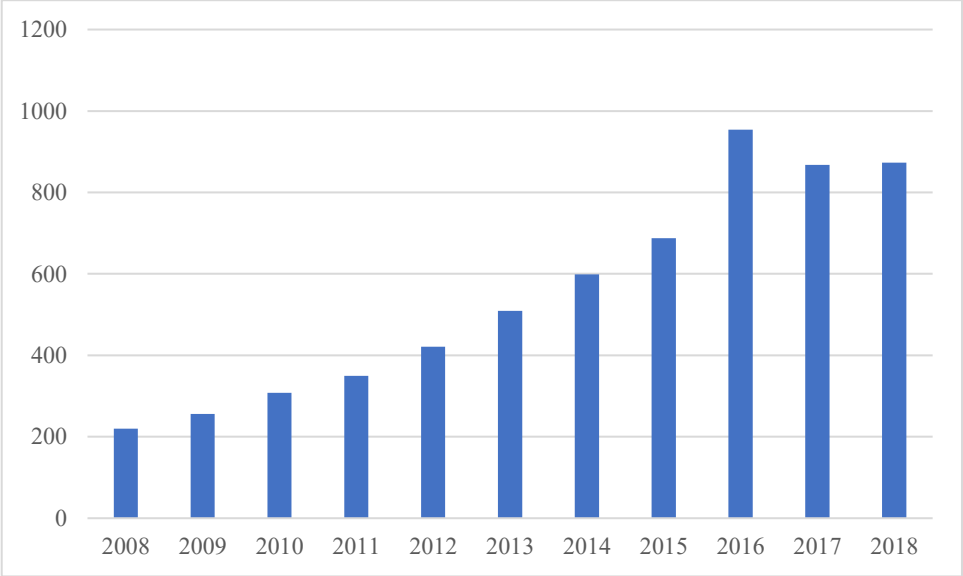

Figure 2-7: Number of active breweries in Italy in the decade 2008-2018 (our elaboration on data The Brewers of Europe, 2014 and 2019; AssoBirra, 2018)

Countries like Germany and United Kingdom, which have dominated the statistics seen so far, had other alcoholic habits than Italy in which the consumption of wine predominates on the total consumption of alcoholic beverages but, as showed in Table 2-3, beer increased its share in recent years.

Table 2-3: Consumption of beverages in Italy (our elaboration on data AssoBirra, 2016 and 2018)

	Consumption (millions of hl)				**Consumption Per Capita (litres)**			
	2015	*2016*	*2017*	*2018*	*2015*	*2016*	*2017*	*2018*
Beer	18,9	18,7	19,7	20,3	30,8	31,3	32,5	33,6
Mineral water	116,7	126,0	128,0	135,0	193,0	208,0	211,0	225,0
Wine	22,0	21,8	22,4	23,0	36,2	36,0	37,0	40,0
Spirits	1,0	0,98	1,0	1,0	1,6	1,5	1,7	1,7

Beer is increasingly becoming part of the consumption habits of Italians. This is confirmed by the increase in volume, production and per capita consumption in Italy in 2018. The increase in consumption has had a positive impact on the entire supply chain from the field to the final costumer, favouring and increase in employment in the sector, giving directly work today to more than 5.500 people for a total of the sector of more than 140.000 people. In 2018 beer consumption in Italy increased by 3,2% rising from 19,7 million hl of the previous year to 20,3 million hl (Figure 2-8).

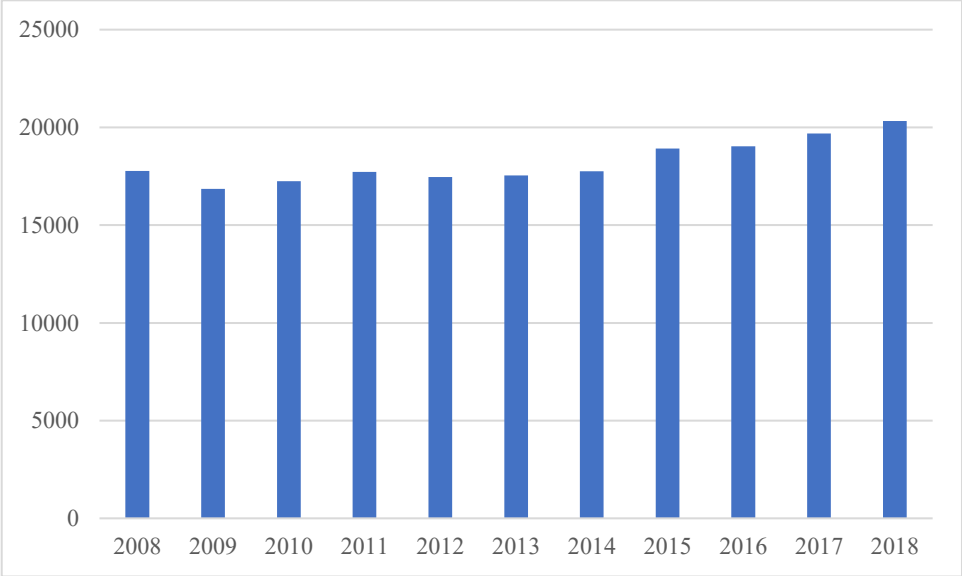

Figure 2-8: Beer consumption in Italy in the decade 2008-2018 (in 1.000 hl)(our elaboration on data The Brewers of Europe, 2014 and 2019)

The growth has resulted in an increase of 3,4% per capita consumption which in 2018 reached its historical peak corresponding to 33,6 litres. (Figure 2-9) Definitively, almost one

Italian out of two drinks more beer than 5 years ago, with a percentage of Italians drinking beer reaching 77% (AssoBirra, 2018). In 2018, for the first time, Italians spent a billion euros on beer.

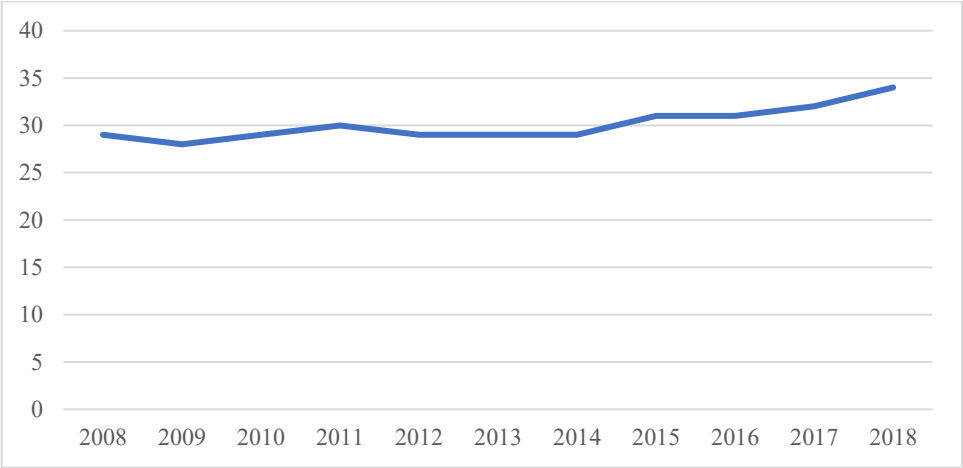

Figure 2-9: Italy per capita consumption trend in the decade 2008-2018 (in litres) (our elaboration on data The Brewers of Europe, 2014 and 2019)

The most sold packaging and consequently in which beer is consumed in Italy, reflect the forecasts on the use of containers in the European markets according to which the most used packaging are not-returnable glass bottles. 78,79% of containers used in 2018 for beer packaging fall into this category. Returnable glass bottles that are not very common in the developed market of Europe cover only the 4,73% of the total containers used for packing beer. Cans represent the 4,85% and the kegs had remained more or less stable from 2013 (11,68%) to 2018 (11,63%) (Figure 2-10).

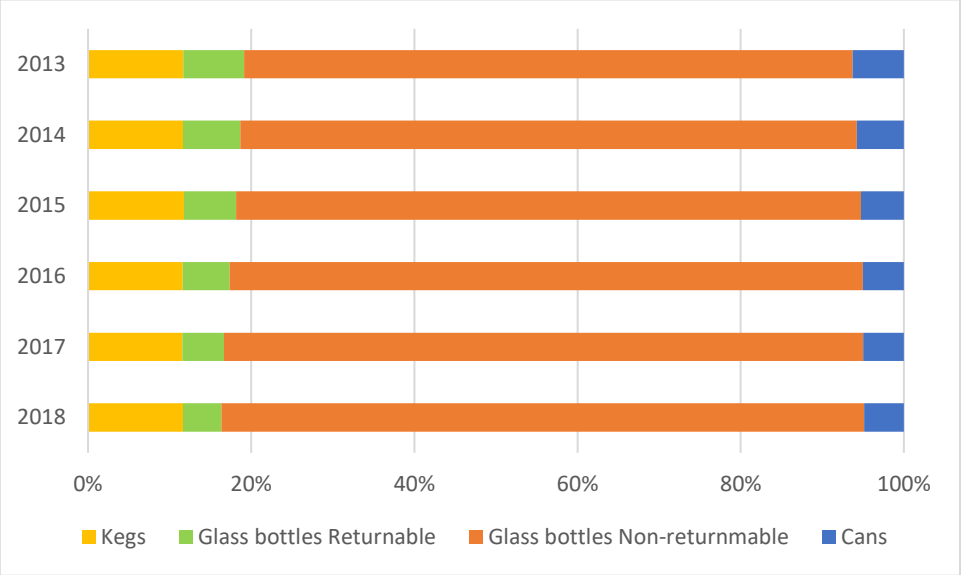

Figure 2-10: Packaging used for beer 2013-2018 (our elaboration on data AssoBirra, 2018)

About places of consumption, as confirmed by the last several years trend, Italians prefer drinking beer at home. The supremacy of home consumption (off-trade) over consumption outside home (on-trade) is shown in Table 2-1. 2018 on-trade consumption was 36% of the total, down 1,6% from 2017, while 64% of purchases took place in the modern and traditional distribution sector.

The beer image and its consumers are changing: both men and women are more curious and interested. Beer is a drink that accompanies an increasing number of Italians, who in turn are more responsible and informed and always ready to save a spot at the table for the golden drink. According to the survey commissioned by AssoBirra to AstraRicerche in 2018, beer therefore returns an image of a drink that sees its reputation strengthened on one hand, and its nature as a meal drink on the other. A drink for transversal consumption, by age and geographical area. The female category is growing, ever closer to the male consumption numbers. Consumers who increasingly appreciate the beer variety, ready to experiment with new ways of consumption, attentive, interested and aware (Carbone and Quici, 2020; Lerro *et al.*, 2020). 70% of Italian women drink beer, 30% of those twice a week, with an increment during last 5 years of 4 women out of 10 drinking more beer. In 2018, low/non-alcoholic beers consumption continues to decrease reaching 1,75% of total beer consumption respect to the 1,86% of the previous year and 2,63% of 2015. Lager beers too continue to lose market share from 92,94% of the year 2013 to 86,56% of the year 2018, while Special beers in 2018 doubled

their market share (11,69%) compared to the percentage of the year 2013 (5,44%) (Figure 2-11) (AssoBirra, 2018).

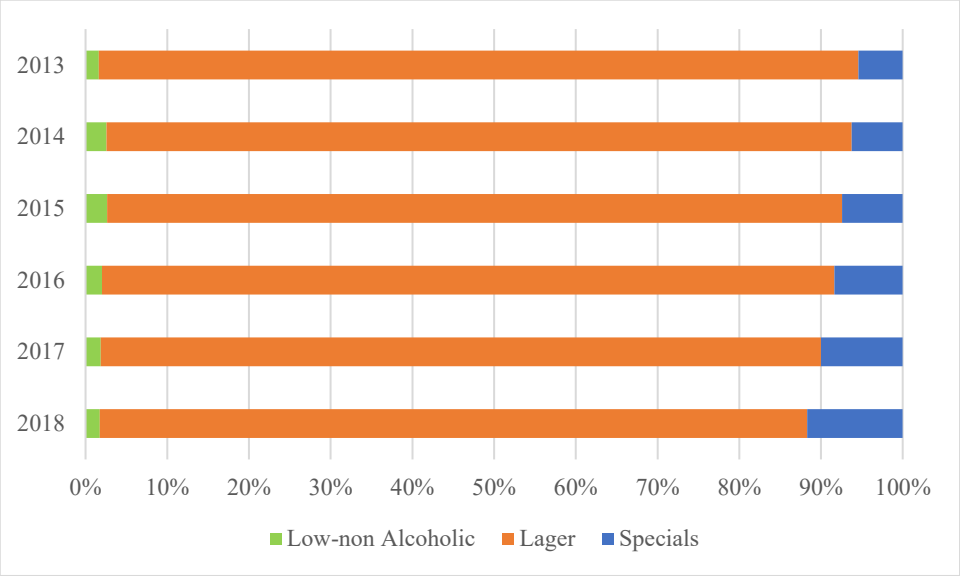

Figure 2-11: Italian beer market segmentation by type of beers 2013-2018 (our elaboration on data AssoBirra, 2018)

Italy, in 2018, was the 9th beer producer in EU with 1,6 billion l, 4% of the total EU production. In this year, Italy seen the largest increase in the production of beer containing alcohol from 1,33 billion l of 2017 to 1,6 billion l (+21%), followed by Hungary and Czech Republic that registered respectively +11% and +6% (Eurostat, 2019a). Figure 2-12 shows general overview of beer consumed and produced in Italy in the decade 2008-2018.

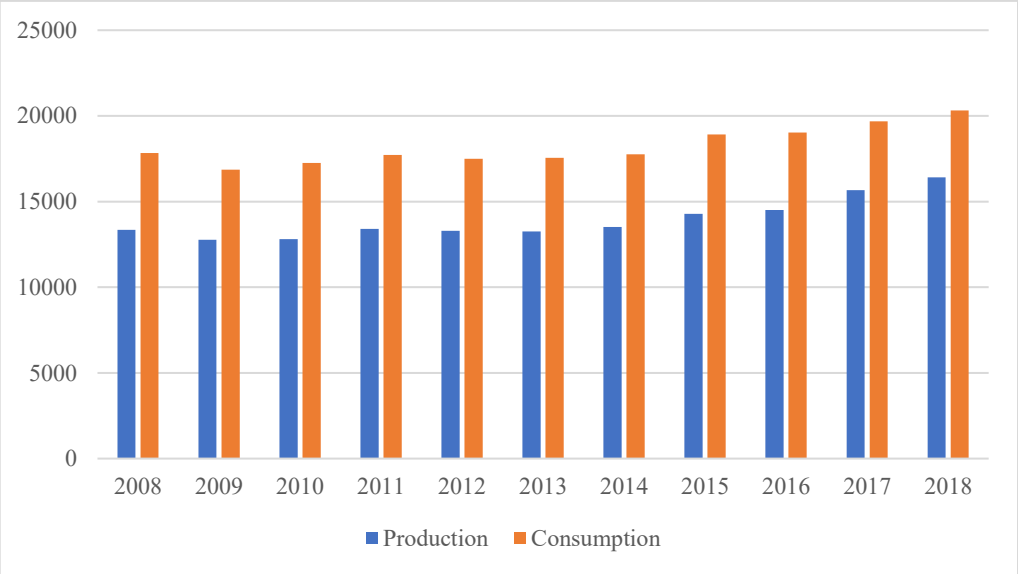

Figure 2-12: Comparison of beer production and beer consumption in the decade 2008-2018 in Italy (in 1.000 hl) (AssoBirra, 2018)

If national production mainly covers the internal market (about 70% of national consumption), Italian beers also find growing appreciation abroad (over 15% of production is sold beyond national borders), with growth of exports which in 2018 scored +6,6%. (Figure 2-13) Italy exports 72,5% of total beer exported to EU-28 countries (48,9% to United Kingdom) and the remaining 27,5% mainly to United States and Australia (AssoBirra, 2018).

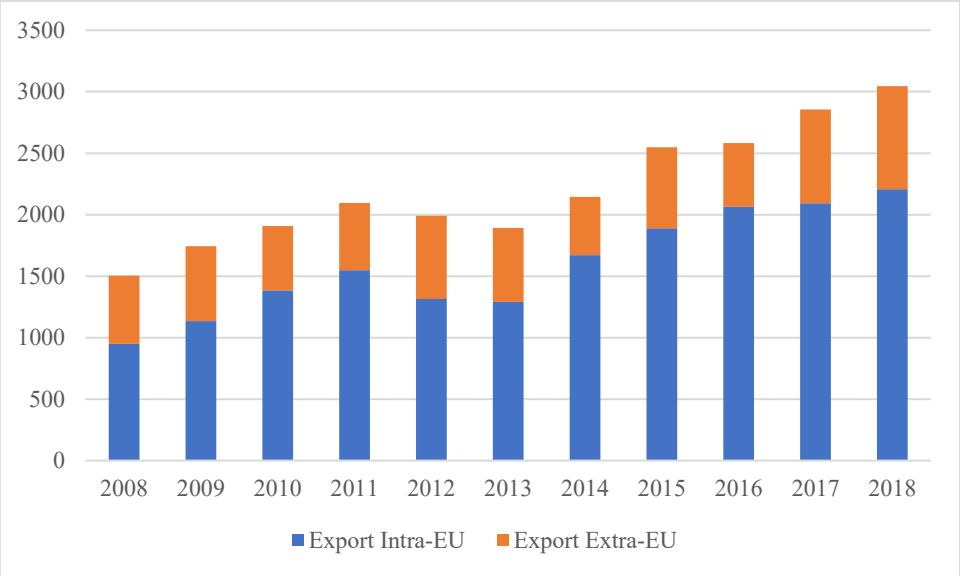

Figure 2-13: Quantity of beer exported from Italy to Intra and Extra-EU countries in the decade 2008-2018 (in 1.000 hl) (our elaboration on data The Brewers of Europe, 2014 and 2019)

Nevertheless, in the face of these excellent results, the sector also presents significant problems such as excise duties and lack of raw material, especially malt and hop. In Italy, beer is the only mealtime drink subject to excise duties (€ 2,99 per hectolitre and degree Plato from the 1st January 2019), a rate that places the country in the high end of the tax burden on the product, if we compare it internationally. Italian beer production is also subject to numerous supply bottlenecks, result of ancient legislation that we will see later and an inefficient organisation of the supply chain, from the cultivation of barley to its subsequent malting. Almost two-third of the malt necessary for the production of beer and almost all the hops needed are currently imported, hindering the growth of the sector, especially in those areas where transport weighs more. Figure 2-14 shows the growth of Italian malt production from 2008 to 2018 underlining 5,5% malt production increase from 75.800 tons in 2017 to 80.000 in 2018. However, this quantity it is only sufficient to cover around 30% on the malt needs in our country.

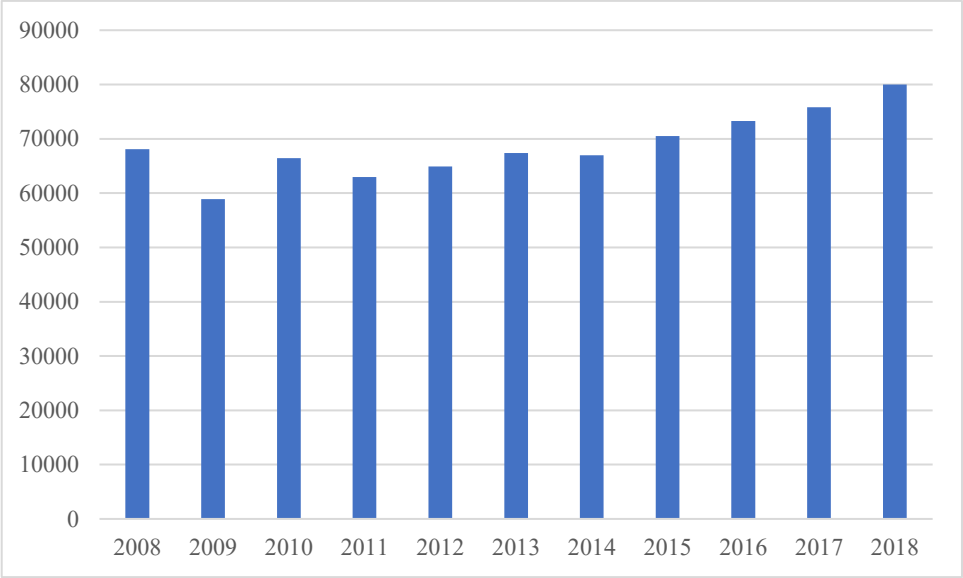

Figure 2-14: Italian production of malt (tons) 2008-2018 (AssoBirra, 2018)

Malthouses in Italy are located in Lazio and Campania regions and are respectively Saplo Spa (Rome) active since 1964 and Agro Alimentare Sud Spa (Potenza) active since 1982 (Fastigi *et al.*, 2015). Italy imports malt mainly from Germany, France, Austria, Czech Republic and Belgium/Luxembourg in order of imported quantities. This condition exposes the national beer brewing industry to raw material price instability when there are supply shortages on the international markets. For example, as a result of bad weather conditions, European production of barley decreased by 5% in 2017 with sharp falls in Denmark (-26%) and Germany (-12%), countries that represent the heart of the EU production. Drought conditions and high temperatures generated a rise in the price of barley that in 2017 reached the highest level since 2013, with peaks of up to +30% and repercussions on the entire supply chain (AssoBirra, 2018). Regarding import of beers, Italy in 2018 imported 6,6 million hl from intra-EU States

and 348.000 hl from extra-Eu countries, scoring +1,2% in comparison to 2017 (Figure 2-15) (The Brewers of Europe, 2019).

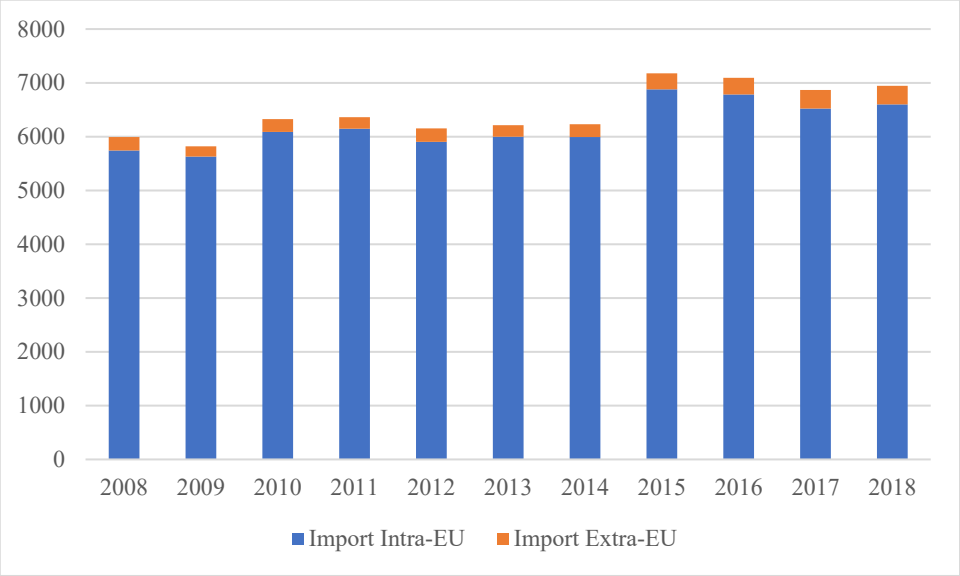

Figure 2-15: Quantity of beer imported in Italy from Intra and Extra-EU countries in the decade 2008-2018 (in 1.000 hl) (our elaboration on data The Brewers of Europe, 2014 and 2019)

As shown in Table 2-4, top 3 EU-28 countries from which Italy import beer are Belgium/Luxemburg, Germany and Netherlands covering together the 69% of total beer imported. Imports from Extra-EU countries account for 5% of the total and the major countries from which Italy imports are Mexico and China (AssoBirra, 2018).

Table 2-4: Top 3 EU-28 countries from which Italy imports beer (AssoBirra, 2018)

	2015	*2016*	*2017*	*2018*	*% TOT*
Belgium/Lux	614.448,73	930.126,87	1.942.146,7	2.019.254,4	29,06
Germany	3.400.794,87	2.958.521,42	2.051.646,68	1.841.813,45	26,51
Netherlands	688.250,26	773.492,82	747.021,03	903.554,98	13,00

In 2018, the estimate of the average monthly expenditure of families residing in Italy was € 2.571, substantially unchanged compared to 2017 (+ 0,3%). Food and alcoholic beverages absorbed 18% of the monthly quota. Households spent on these goods on average € 462, without significant differences compared to € 457 in 2017 (Istat, 2019). In Italy, the price of alcoholic beverages is in line with the EU average previously showed in Figure 2-6.

A schematic summary of the Italian scenario regarding beer in relation to the various factors analysed so far is available in Table 2-5.

Table 2-5: Summary of the Italian scenario (our elaboration)

	2017	***2018***
Number of active breweries	868	873
Consumption (million hl)	19,7	20,3
Per capita consumption (l)	32,5	33,6
Production (million hl)	15,6	16,4
Total export (million hl)	2,8	3,0
Total import (million hl)	6,8	6.9

CHAPTER III
REGULATORY FRAMEWORK ON THE BEER SECTOR

3.1 Introduction

Beer, like all foods, is subject to an articulated series of national and European regulations with the aim, first and foremost, of protecting consumer safety and, therefore, of strictly regulating all aspects of production, fair competition and commercial exchanges, of correct designation and presentation of the product, information to be given to the consumer, etc. In this chapter we will analyse the aspects related to the management of Italian and European legislation regarding beer. We will talk about the Common Market Organization (CMO) as regards the production and marketing of raw materials, hops in particular. CMOs have been a key component of the common agricultural policy (CAP) since its inception, providing the framework for the market support schemes set up in the various agricultural sectors. The CAP is one of the oldest common policies of the European Union, established in 1963, initiated after the Second World War as part of the Treaty of Rome, signed in 1958. It has provided the basis for Europe's food and agricultural programs. Over the last decades, the CAP has been moving away from a production of intervention focused policy towards more market orientation, against a background of a more integrated and liberalized world economy (Delayen, 2007; Vandenberghe, 2015). Moreover, we will talk about the European and Italian regulations governing the production and placing on the market of the finished product and last but not least, we will deal with the thorny problem of excise duties by analysing the current situation and ongoing initiatives.

3.2 Hops Common Market Organization

The common organisation of the market (CMO) sets out the main legal provisions covering the hops sector: certification, producer groups and imports. CMOs were set up as a means of meeting the objectives of the CAP (Article 40 TFEU), and in particular to stabilise markets, ensure a fair standard of living for farmers, and increase agricultural productivity. CMOs cover

the products listed in Annex I of the TFEU and encompass a range of mechanisms governing the production and trading of those products in the European Union. The guarantees provided under those mechanisms vary according to the specific characteristics of individual products. The CMO market measures come under the first pillar of the CAP.

Before the entry into force of the single CMO in 2007 (Council Regulation (EC) n. 1234/2007), there were 21 separate CMOs, each covering specific products, and all governed by their own basic regulations. These CMOs were: cereals, pork, poultry and eggs, vegetables and fruits, banana, wine, dairy products, beef meat, rice, olive oil and olives, sugar, flower-growing, dry forages, fruits and vegetables added value, tobacco, flax and hemp, hop, seeds, sheep and goat meet. Within CMOs, each group of food and agricultural products is organized by harmonized rules. For practical purposes, the CMOs set the price of agricultural products for each European market. They allocate subsidies to producers in the sector, establish the mechanisms that regulate the production (quotas, set aside, national guaranteed quantity) and set the terms for exports and imports with developing countries. The common market organization in the hops sector was established in 1971. The essential elements of the basic regulation are the rules governing the marketing of hops by means of a certification procedure and preliminary contracts, the recognition and promotion of producer organizations and exchanges with third countries (European Commission, 2003; Delayen, 2007).

In 2005, with the European Regulation 1952/2005, the Council of the European Union established more specific rules regarding the trade and production of hops in Europe defining hops as “the dried inflorescences, also known as cones, of the (female) climbing hop plant (Humulus lupulus); these inflorescences, which are greenish yellow and of an ovoid shape, have a flower stalk and their longest dimension generally varies from 2 to 5 cm”. In addition, it established hops business, producer's association and certification requirements for the marketing of hops. Methods of certification procedure for hops and its derivates are instead shown in Regulation (EC) 1850/2006. Community hop producers receive financial support. Producer organizations can decide whether to pay the aid to their members in whole or in part in proportion to the area cultivated; a maximum of 20% of the aid can be used to facilitate the conversion to other hop varieties or to finance other measures of common interest (European Commission, 2003; *Regulation (EC) 1952/2005*, 2005; *Regulation (EC) 1850/2006*, 2006).

Following a series of reforms, as anticipated, the 21 separate CMOs were codified in 2007 with the European Council Regulation n. 1234/2007 into a single CMO, covering all agricultural products with the exception of fishery and aquaculture products. Reforms to the CAP have also made the policy progressively more market-oriented and scaled down the role

of intervention tools, which are now regarded as safety nets to be used only in the event of a crisis (*Regulation (EC) 1234/2007*, 2007). The CMO has an internal heading (covering market intervention and rules on marketing and producer organisations) and an external heading covering trade with third countries (import and export certificates, import duties, administration of tariff quotas and export refunds, etc.). The CMO deals with the competition rules applicable to businesses and the rules on State aid. It also covers general provisions on exceptional measures (including measures to guard against market disruption caused by price fluctuations or other events, market support measures in the event of outbreaks of animal diseases or a loss of consumer confidence due to public, animal, or plant health risks, and measures relating to concerted practices adopted when markets suffer serious imbalances), and the new reserve fund for crises in the agricultural sector (Massot, 2020).

About a decade ago, the contract market was in decline, given the increasingly abundant offer at the best price on the free market. However, growers continue to prefer the contract system as a marketing method, as contract prices are more stable in the long term (European Commission, 2003). There was therefore a situation of objective disparity of contractual force between buyers and sellers. The "sense of the market" had not yet fully matured in agricultural entrepreneurs who often did not fully assert the economic potential of their products by selling them without knowing themselves the qualities they possessed. This situation, widespread throughout the Community, suggested to EC to encourage the establishment of producer organizations: groups or individual products (fruit and vegetables, cereals, etc.) in order to try to balance the contractual strength of the agricultural part with respect to the industrial transformer one. Therefore, producer groups in the hops sector, in the fruit and vegetables sector, etc., which can, in certain cases, receive Community financial support to intervene on the market, are expressly provided for. Art. 122 of Regulation (EC) 1234/2007 contains a specific provision for organizers and producers in the hop, olive oil and table olives and silkworm sectors. Producer associations, for which recognition of the Member State is envisaged, including through its decentralized structures, can be assigned, according to Community law, regulatory functions and operational functions. The regulatory functions allow producer organizations to dictate to their members rules relating to cultivation (or breeding) and, above all, relating to the characteristics of the products to be placed on the market. The operational functions consist instead of carrying out tasks relating to the marketing of the members' products, sometimes optional and sometimes mandatory, which must sell through the organization all or part of their production (Costato, 2008).

Rules on the relationship between the single CMO regulation and the Horizontal Regulation 1306/2013 (on the financing, management and monitoring of the common agricultural policy), applicable definitions, marketing years and reference prices are laid down in the first part of Regulation 1308/2013 establishing a common organization of the markets for agricultural products, by repealing, among other things, Regulation (EC) 1234/2007. Article 77 of this Regulation concerns hop products collected or obtained within the European Union specifying that they are subject to a certification procedure. The certificate can be issued only for products that have the minimum quality characteristics valid in a given marketing phase. In the case of hops powder, hops powdered enriched with hops, hops extract and blended hop products, the certificate can only be issued if the α-acid content of these products is not lower than that of the hops from which they were obtained. The certificate contains, at least, mandatory information regarding:

- the place or places of production of the hops,
- the year or years of collection,
- the variety or varieties (*Regulation (EU) 1308/2013*, 2013; Vandenberghe, 2015).

The last chapter of the continuous evolution of legislation regarding the common agricultural policy was written on 1st June 2018, when the European Commission put forward three legislative proposals regarding the CAP after 2020:

- Amending Regulation (on the amendment of the Common Market Organisation for Agricultural Produce; Regulation (EU) 1308/2013);
- Regulation on CAP strategy plans;
- CAP horizontal regulation (on the financing, management and monitoring of the CAP).

The European Commission is proposing a more flexible system by means of which the operation of the CAP is to be simplified and modernised. There will be a change of focus from observing regulations to achieving results and performance. The individual countries are to present strategy plans in which they will show how they intend to implement the EU-wide objectives, while at the same time taking the particular needs of their farmers and rural communities into account (*The Barth Report*, 2019). To date, no changes are expected with regard to hop CMO. Once the post 2020 proposals for the CAP will be confirmed, changes will be assessed in order to improve the organization of the market.

Main events that took place from 1958 until now are summarized in Table 3-1.

Table 3-1:Main events in the hop sector CMO (our elaboration)

YEAR	EVENT
1958	Treaty of Rome.
1963	CAP into effect.
1971	Establishment of CMO in hop sector.
2005	Regulation (EC) 1952/2005 gave specific rules regarding trade and production of hops in Europe.
2006	Regulation (EC) 1850/2006 regarding methods and certification procedures for hops and its derivate.
2007	Regulation (EC) 1234/2007 codified the 21 separate CMOs into a single CMO.
2013	Regulation (EU) 1308/2013 regarding agricultural products CMO.
2018	Legislative proposals regarding CAP after 2020.

3.3 Beer legislation

To the Duke Guglielmo IV of Bavaria (1493-1550), we owe the first writing which establishes rules for the production of beer. This law is identified as the "Reinheitsgebot" commonly known as the "edict of purity" or "purity law", enacted in the Bavarian city of Ingolstadt on 23rd April 1516 and subsequently confirmed several times. By law it was established that beer could only be produced from barley malt, water and hops. In reality, the law had to be temporary in order to protect the health of citizens as the use of raw materials that did not comply with the recipe and sometimes harmful could undermine the quality and therefore the safety of consumers. By forcing citizens to produce beer with only barley, he avoided using the little wheat produced that year and dedicating it to the production of basic necessities such as bread. With the same edict, the Duke also fixed the price of beer by differentiating between the cheaper beer produced in autumn-winter and the more expensive beer produced in summer. Subsequently, the "purity law" was exploited by German industrialists for propaganda purposes, trying to combine the term "purity" with that of "high quality". The edict remained in force until 1992, the year of European unification which created greater commercial traffic by creating the common market, the customs union and the freedom of movement, work and investment within the Member States. Thanks to these new ways of trade in products, Germany had to reduce the edict restrictions in order to sell its beer

even outside the territorial borders (Turri, 2010; Dal Maso and Bianco, 2014; Rissanen and Tahvanainen, 2019).

The legislation regarding beer is managed differently from country to country within the European Union, through laws, legislative decrees, ministerial decrees and so on. In Italy, the reference legislative text is, as already anticipated, quite dated. It dates back to 16th August 1962. Law 1354 on the "hygienic discipline of beer production and trade" is in fact still the main reference text, even though over the years it has been updated several times in content and sectors. This text is organized in 10 chapters namely:

I- Definition
II- Requirements for the raw materials of beer
III- Production and premises
IV- Installations and equipment
V- Personnel
VI- Operation licence
VII- Import and export
VIII- Deposits for wholesale trade and sale rooms
IX- Supervision and penalties
X- Transitional and final provisions

The law, as it is possible to guess from the titles of the chapters alone, is quite complete and affects all aspects concerning the production of beer in all its aspects, trade and penalties.

One of the most important Article regarding the history of beer definition is for sure Art. 1 that established that the name «beer» is reserved for the product obtained from alcoholic fermentation with strains of *Saccharomyces carlsbergensis* or *Saccharomyces cerevisiae* of a must prepared with malt also roasted of barley or wheat or their mixtures and water, made bitter with hops, its derivatives or both.

Articles 2 and 12 deal with the labelling, more precisely with the minimum information that must be compulsorily included on the label before the product is placed on the market, nationally or abroad, as well as the requirements that the labels of imported beers must have (*Law n. 1354*, 1962).

The reference text has been updated several times over the years in various points such as in 1992 with Legislative Decree n. 109 of 27th January, which establishes rules regarding the labelling and advertising of food products. From 2011 onwards, with the release of the European Regulation 1169, concerning the provision of food information to consumers, Italy

has aligned itself with regard to this aspect of production and marketing with Community legislation, taking this regulation as a reference for the labelling of food products.
The mandatory information about food products in this European Regulation concerns:

- the name of the food;
- the list of ingredients;
- any ingredient or technological adjuvant listed in Annex II of Regulation (EU) 1169/2011 or derived from a substance or product listed in that Annex which causes allergies or intolerances used in the manufacture or preparation of a food and still present in the finished product, even if in an altered form;
- the quantity of certain ingredients or categories of ingredients;
- the net quantity of the food;
- the minimum retention period or the expiry date;
- the particular storage conditions and / or the conditions of use;
- the name or business name and address of the food business operator referred to in Article 8, paragraph 1 (which states that the food business operator responsible for food information is the operator with whose name or with whose business name the product is marketed or, if that operator is not established in the Union, the importer on the Union market);
- the country of origin or place of provenance where provided for in article 26 of the same regulation;
- instructions for use, for cases where their omission would make it difficult to use the food properly;
- for drinks containing more than 1,2% alcohol by volume, the actual alcoholic strength by volume;
- a nutrition declaration (*LD n. 109*, 1992; *Regulation (EU)1169/2011*, 2011).

Regarding the production of beer, in Italy on 2nd May 1996 the ministerial decree 325 was issued (entered into force on 6th July 1996) concerning the use of lactic acid bacteria in the acidification of the must destined for the production of beer. Article 1 states that it is allowed to use cultures of lactic bacteria belonging to the *Lactobacillus* genus in the acidification of the must destined for the production of beer. These lactic acid bacteria must be of animal or vegetable origin. Article 2 specifies that the cultures of *Lactobacillus spp* must be suitable in terms of hygiene and health and must have the following characteristics:

- absence of pathogenic germs or their toxins;

- presence of saprophytic microorganisms of different species, in quantities not exceeding 1000 CFU / millilitre or gram;
- lactic bacteria cell number not less than 1.10^6 / millilitre or gram.

Art. 3 deals with the production of cultures of lactic bacteria which, in order to be placed on the market, must come from factories or preparation and packaging laboratories that have adequate facilities for their preparation and control, particularly aimed at to ascertain the hygienic-sanitary requirements and characteristics referred to Art. 2.

The following articles 4 and 5 deal with the marketing of lactic acid bacteria (including the importation of lactic acid bacteria cultures and relative certifications that must accompany the product to ensure their safety) and the mandatory information that must be present on the label at the time of placing the product on the market.

Art. 6 reiterates how the rules relating to this regulation are to be applied only to cultures of lactic acid bacteria legally produced and marketed in Italy (*MD n. 325*, 1996).

Until now, beer has been treated without any kind of differentiation, i.e. there has never been talk of a type of beer other than the one produced by the industries and marketed on large-scale organized distribution. In Italy, a differentiation is made for the first time in 2010 with Ministerial Decree n. 212, in which it is indicated that beer must not be classified only as an alcoholic beverage, but as an agricultural product as its production is an activity linked to agriculture. This Ministerial Decree introduced the term "agricultural brewery", which represents a peculiarity for our country and we will elaborate on the topic in Chapter IV.

However, the term craft beer has never been mentioned in national laws and European regulations so far, in fact the sector had to wait until 28th July 2016 the law n.154 before a regulation was issued concerning this product. We will deal with this in detail in Chapter IV. Summary of the main regulation regarding beer is available on Table 3-2.

Table 3-2: Summary of the main regulation regarding beer (our elaboration)

YEAR	REGULATION	AIM / MAIN CONTENT
1516	German Purity Law	First writing establishing rules for beer production.
1962	Law 1354 (IT)	Italian reference legislative text (definitions, requirements, trade, etc.).
1992	LD n. 109 (IT)	Establish rules regarding labelling and advertising of food products.
1996	MD n. 325 (IT)	Concerning the use of LAB in the acidification of the must destined for beer production.

2010	MD n. 212 (IT)	Beer as agricultural product. Agricultural breweries introduction.
2011	Regulation (EU) 1169/2011	European regulation regarding the provision of food information to consumers.
2016	Law n. 154 (IT)	Craft beer definition

3.4 Excise duty

During its history, each Member State of the European Union has decided to apply taxes on the manufacture of some consumer products. The most common are those applied to alcohol and all the products obtained from it (wine, beer, spirits etc.) or to oil and all its derivatives intended for the production of energy (gasoline, diesel, methane, butane, kerosene, etc.) or to tobacco and all its derivatives. The term commonly used to define this type of tax is "excise duty". Excise duties are applied by each Member State on its territory autonomously and according to the most disparate criteria.

Italy has adopted a Consolidated Law on Excise which transposes the community legislation (directive 118 of 16th December 2008 of the Council of the European Union concerning the general arrangements for excise duty). The Consolidated Act of the legislative provisions concerning taxes on production and consumption and related penal and administrative sanctions refers to Legislative Decree n. 504 of 26th October 1995, in force since 14th December 1995 (*LD n. 504*, 1995).

Excise duty is therefore a tax on the manufacture and sale of consumer goods. It is a tribute applied to specific types of products, linked to the quantity and not to the price, and influences the cost of the product. However, this tax must be paid in the country of consumption; therefore, in the case of export, the producer will not have to pay it, but the importer with respect to the rates established in the country of release for consumption. This principle applies both to EU member countries and to non-EU countries (AssoBirra, 2017).

As already mentioned, the taxation of alcoholic beverages, and in particular of beer, is a source of litigation above all for two reasons: with the increases of the last few years, taxation has reached levels that considerably weigh on consumption, in addition there remains the unjust difference between beer and wine, as an excise duty of zero acts on the latter. They also detect other accessory elements such as the differences in territorial treatment and the counting performed on the basis of the Plato degrees of the must (measure of the sugar content in the

must) instead of on the finished product. The Italian situation regarding excise duties on beer differs from the European one. In European legislation, the regulation of excise duties is contained in two Directives (n. 83 and n. 84 of 1992), which establish the criteria with which the Member States must comply. The Directives identify not only beverages subject to excise duties (wine, beer, spirits, etc.), but also the minimum rates. However, each State remains free to define the effective rates. For wine, in Italy the minimum rate is zero, while more than half of the countries of the European Union apply higher values. The Directives also specify when excise duties are to be collected; that is, when the product is placed on the market. The excise duty is in fact a manufacturing tax, but payment occurs when the product is released for consumption. This means that the Italian legislation, based on the production of must, is a forcing of the European Directives. Paying on the must also means paying on the waste (equal to about 8%) and therefore certainly significant additional costs for the artisans of the sector. Figure 3-1 shows the revenue from excise duties on beer in Italy.

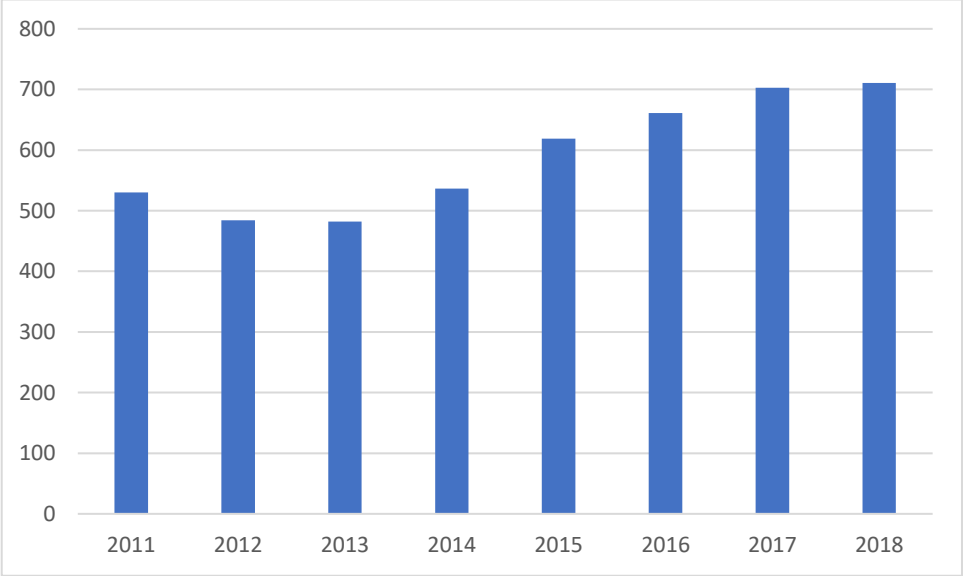

Figure 3-1: Revenues from beer excise duty in Italy in million € (2011-2018)

(AssoBirra, 2018)

Converting these words into numbers, from 2016 onwards, the brewing sector has received particular attention from the legislator. Between 1st January 2003 and 1st January 2015, the excise duty on beer in Italy have more than doubled: +117%, an increase among the highest in Europe. If VAT is added to the excise duty (increased in the same period from 20% to 22%), the tax burden has increased by more than 120%. Then, in a period of only 15 months, beer has undergone a 30% increase in direct taxation. From October 2013 to January 2015, in fact,

the government had increased the excise duty on beer from € 2,35 to € 3,04 per hectolitre on Plato degree. This factor, combined with the continuing economic crisis, has kept the beer sector stagnating. Fortunately, in 2016, an important turnaround partially corrected what happened, contributing to the recovery of the growth of the beer market in Italy. As shown in Figure 3-2, the decreases performed in the three-year period 2017-2019 do not even reach 1,7% and, in the face of 30% increases in the three-year period 2013-2015, this measure is not sufficient and therefore it is necessary to speed and depth the road map by the Government and the Parliament in order to return to pre-crisis levels in a reasonable time. However, the path taken by the institutions seemed to be definitively the right one (AssoBirra, 2018).

Figure 3-2: Evolution of excise duties on beer 2013-2019 (AssoBirra, 2018)

The intuition that the path taken for the protection and development of craft breweries and craft beer was good was confirmed by the Ministerial Decree of 4th June 2019 which introduced, as required by the 2019 Budget Law, the excise discount equal to 40% to the benefit of Italian breweries that fall within the legislative definition of craft beer and that do not produce more than 10.000 hl per year, starting from 1st July 2019 (UnionBirrai, 2019). In addition, the same Ministerial Decree provides that beer is taxed when it is released for consumption or when the product leaves the warehouse to be sold. A pleasant novelty for Italian producers, because as already mentioned, before this decree the product was taxed directly in the must production phase, with a clear advance of the taxation with respect to the moment of real production and, above all, also by taxing that part of the product which, at the end of the production cycle, was discarded (Decree 4th June 2019, 2019).

CHAPTER IV
OPPORTUNITIES AND CHALLENGES IN THE BEER SECTOR: THE CASE OF CRAFT BEER

4.1 Introduction

Despite the globalization and homologation trends characteristic of industrial production, hundreds of beer styles fortunately continue to exist and are mainly produced in microbreweries and brewpubs. These two realities, which the consumer sometimes struggles to distinguish, differ from different points of view but have a fundamental point in common: the production of beers that, because traditional and almost forgotten or because extremely daring and innovative, deviate from the proposed offer from industrial breweries. These beers have three peculiar characteristics: first of all, they are produced with an artisanal and natural process that differentiates them from commercial beers; secondly, they are produced with processes that preserve their organoleptic characteristics as much as possible; finally, they are available in different varieties to satisfy different tastes. In some regions, such as the United Kingdom, microbreweries and brewpubs have a long history behind them and are part of the cultural identity of the place; in others, such as the United States, these are recent realities, created to meet the needs of a new group of consumers who are no longer satisfied with standardized products and perceive the consumption of "craft beer" as a means of identification and social affirmation. A microbrewery is an independent brewery quite similar to an industrial brewery, except for the quantity of beer produced, and for the packaged products that are sold in a relatively small area. The microbreweries, having to compete with the others industrial beers, are placed in strategic points and well served by transport networks; particular attention is paid to the choice of distributors and the control of production costs. The shelf-life of the product is one of the basic characteristics that differentiates microbreweries and brewpubs: that of beer produced in microbreweries must be rather long and this entails an increase in production costs, which must also include filtration, stabilization, etc. A microbrewery therefore looks like a real "miniature brewery", whose design must mainly respond to the need to produce high quality beers while keeping costs low; it is also necessary to carry out all the quality checks commonly required by current regulations.

Brewpubs, unlike the microbreweries, produce beer only in the quantity necessary for the sale on the spot. It is therefore clear that the purpose of these breweries is more similar to that of a restaurant business or an old tavern, rather than that of a modern brewery. For this reason, brewpubs are located in areas that are easily accessible to the public, such as city centres or near commercial areas. In brewpubs, the consumption of beer is direct and takes place within a few days of the end of the maturation. The beers, unfiltered and not pasteurized to preserve their organoleptic characteristics, are served on tap. This allows significant savings because it makes beer stabilization and packaging unnecessary; quality controls are also simplified overall. The design of a brewpub is set up differently than that of breweries and microbreweries: the production plants are in fact visible, so that the consumer can live a complete sensorial experience, which includes not only the taste and aroma of the beer he is drinking, but also the sight and smell, which is stimulated by the characteristic smells of the production. (Figure 4-1) The number of operations carried out inside the brewpub, and consequently the complexity of the system, can vary according to the production method chosen and the variety of beers proposed: the best brewpubs minimize the number of operations carried out outside of the building to offer a complete overview of the production; they avoid the complete automation of production, enhancing the figure of the master brewer; production varies according to current trends, however always focusing on local beers since local beers have, in the eyes of the consumer, an added value that differentiates them from all the alternatives offered by the market (Braun and Dishman, 2006).

Figure 4-1: Interior of a brewpub with visible production plant (Fermento Birra website, 2010)

4.2 The craft beer revolution

The transformation of the beer industry has certainly been favoured by the increasing attention paid to what, in the collective imagination, refers to a pre-industrial mode of production; a new cultural climate, therefore, capable of significantly influencing the sphere of consumption. Since craft beer is generally considered to be of higher quality than industrial beer and perceived by consumers as "local", this sector has been particularly skilled in exploiting the increasingly widespread need to reaffirm an identity (collective or individual, often linked to a physical location) as an act of defence of one's own territorial peculiarities, threatened by the approval imposed by the globalized economy. All this without underestimating the quality aspect of the final product, the undisputed strength of craft breweries (Fastigi *et al.*, 2015).

4.2.1 The craft beer movement

The progressive diffusion of microbreweries and, speculatively, a growing popularity of the beers they produce among consumers, in a country like Italy with a strong wine tradition, allows to speak of a real "movement" in the brewing world. Italian consumers are taking part in what is called "taste revolution" in the literature, expressing a willingness to pay more for a craft beer than a commercial beer to have a differentiated, natural and creative quality product. The link between beer and territory gives the product a uniqueness that makes beer interpret not only as a food product, but also adds a cultural value. With the progressive growth of the craft beer sector, the possibility of developing another niche activity that is slowly emerging is to be considered: brewing tourism which, thanks to the link with the landscape, socio-cultural and culinary heritage of value that characterizes Italy, could establish itself as a significant activity related to the craft beer sector. In Italy, food and wine tourism is already well known, albeit with far more marked production traditions and landscape evidence than the emerging beer tourism that could develop similar but still different manners (Menghini, 2016).

Confirmation of the growing interest of Italian beer consumers regarding a different product, more natural and sustainable, arrives from the practice of "homebrewing", that is, of brewing beer at home, that in recent years has increased significantly. What at first glance may seem like a hobby for people with a lot of free time is actually the element that closes the ideal circle in which the long history of beer production can be circumscribed. If in some countries, including Italy, this is a recent phenomenon, in others such as the United Kingdom and the

United States, the return to domestic brewing is a consolidated and constantly growing reality, often driven by the need to reduce expenses: producing beer at home is much cheaper than consuming it in pubs and allows to obtain a product of a much higher quality than that of beers available in supermarkets. For many, however, it is not only about saving money: producing their own beer is a creative and recreational activity, which allows to express your preferences and test your skills. The relative ease of production contributes to creating this trend: if until a few decades ago producing beer at home was an operation that hardly led to appreciable results, with modern kits even the most clumsy can easily enter the world of beer production and, with practice, obtain products of undoubted quality, often able to compete with the microbrewery and brewpub craft beers. In Italy the homebrewing was officially born in 1995, regulated by the (*LD n. 504*, 1995) in which Art. 34, paragraph 3 says verbatim: "Beer produced by a private individual and consumed by the same producer, his family and guests is exempt from excise duty, provided that it is not the subject of any sales activity" (Tepedelen, 2013; Wells, 2015).

In Europe and especially in Italy where craft beer has recently been introduced and is one of the growing segments in the beverage sector, beer drinkers are more and more interested in tasting new craft beers with different aromas, flavours, etc. rather than the usual well known commercial brands (Aquilani *et al.*, 2015; Carbone and Quici, 2020). Among craft beer consumers, the consumption of industrial beer is more functional than sensory or affective, clearly associated with social moments and experiences. Industrial beer drinking experience for consumers can be of low intensity because it is a very common product, with no outstanding special characteristics. Industrial beer is also seen as a product that can be used to get drunk, effect that is explicitly and directly searched, while craft beer is not explicitly searched for the same purpose. For craft beer consumers, industrial beer should be refreshing and should have a thirst soothing effect. It is evident that the experience is centred in its functional characteristic of thirst quencher, rather than a sensory and affective experience based in flavour and enjoyment (Gomez-Corona *et al.*, 2015). According to several studies, the experience of drinking a craft beer is to try something new; the stimuli and intentions are different from those produced by industrial beer in terms of flavours, aroma, texture, colour. Craft beer stimulates taste and smell. Even the purpose of drinking changes, it is no longer a purely social but also a personal experience. Consumers are more curious and want to know more about what they are drinking, they take their time to taste the beer, try to find the flavours and aromas they see written on the label. This type of drinking experience is certainly more careful and critical than that of industrial beer (Gomez-Corona *et al.*, 2015; Lerro *et al.*, 2020).

Craft beer, like any self-respecting movement, has the need, perhaps unconscious in the subjects belonging to the movement itself, to be identified under a symbol or emblem that represents them. The symbol that today represents most of all the movement of craft beer is perhaps the "TeKu" glass (Figure 4-2). TeKu was born in Italy in 2006 from the idea of two very important figures in the national panorama of Italian craft beer such as Teo Musso and Lorenzo Dabove, aka "Kuaska". Teo Musso is the founder of the Baladin Brewery (https://www.baladin.it/) while Kuaska is one of the greatest experts and tasters of craft beer in Italy, as well as an international judge. The name of the glass comes from the fusion of the initials of its 2 inventors, who worked on the idea of designing a universal glass for beer tasting, characterized by shapes and peculiarities capable of enhancing the strengths and weaknesses of each brew product (Turco, 2013).

Figure 4-2: TeKu glass produced by Rastal (Rastal, 2015)

Over time, however, TeKu completely changed its intended use. Born as a glass for tasting, and therefore designed for beer competitions or educational tastings, it slowly began to enter bars, pubs, and therefore even in theme events. From a mysterious object it became more and more widespread, to the point that it became easy to stumble upon it. According to Andrea Turco, judge in national and international competitions, teacher and sector consultant, among the creators of the "Fermentazioni" festival and organizer of the Craft Beer Week in Italy, the definitive step towards this diffusion probably took place with the inauguration of the high-quality venue "Bir&fud" in Rome. When the opening was announced, the owner stated that all the beers would be served in TeKu glasses. In a context of the highest quality from all points of view (beer, culinary, etc.), TeKu was seen as the beer glass par excellence. The choice of Bir&fud marked a definitive furrow for the history of TeKu, directing it towards horizons that probably not even its creators had imagined. It is from here that its elegant and original

shape probably became the symbol of Italian craft beer: not only did its diffusion on the premises increase dramatically, but above all many breweries began to link their image to it. In a short time, brochures multiplied of Italian producers with a full TeKu glass next to their bottles. Today, even the important beer competition "European Beer Star" adopts TeKu as a tasting glass for its jurors from all over the world. All this success has however led to a distortion of the purpose of use of the TeKu. From universal glass for beer tasting to universal glass for beer. These are two very different concepts because according to most, each beer style wants its glass, capable of enhancing its strengths to improve the taste experience (Figure 4-3) (Turco, 2013).

Figure 4-3: To each beer, its glass (Villatora and Bettiol, 2017)

4.2.2 Craft beer as an opportunity for Italian rural valorisation

The Oxford dictionary defines "uniqueness" as "the quality of being one of a kind; unlike anything else". Thus, for beverages (in this case beers) means those that are high differentiated from other products in their category on the basis of perceivable sensory, image, functional, emotional or other product characteristics that are positively valued by the consumers (Cardello *et al.*, 2016).

Craft beer is a unique and special product that differs from other beers for several reasons. First of all, the company itself, which in order to be considered craft brewery and to produce craft beer must comply with the legal limits imposed by the Law n. 154 of 28th July 2016. The

product cannot be pasteurized and microfiltered, therefore also the production process has restrictions, as does the annual quantity of beer produced. Craft breweries that want to further differentiate themselves on the market have the opportunity to become agricultural breweries. In this case, the obligation to produce beer with at least 51% of the raw materials produced by the same company is added to the restrictions and particularities mentioned so far. Currently in Italy, according to Unionbirrai, agricultural breweries represent about 15% of the total craft beweries, with the largest presence in Tuscany, Marche and Abruzzo Regions.

The different flavours and aromas of craft beer compared to industrial beer derive from various factors including the use of high quality raw materials, attention to quality rather than quantity, production process that does not include pasteurization and therefore allows the conservation of flavours and raw material quality characteristics that with the pasteurization temperatures would be lost. As already seen, the main weakness of the craft beer sector in Italy is the difficulty in finding quality raw materials within the national territory (and in sufficient quantities with the availability of constant supply). Hence it would be appropriate to discuss the possibility of enhancing an agricultural supply chain, capable of sustaining the growing demand of the beer industry and, at the same time, it could be a cue to promote a sustainable development of the territory. The malting barley production chain could represent an opportunity for marginal and non-marginal rural areas in Italy. In fact, thanks to its peculiar adaptability, its resistance and its rusticity, malting barley grows in any soil and climate environment, making possible the cultivation in areas which otherwise would not be qualified. Abandoned and disused land could see a genuine renaissance thanks to the cultivation of a cereal that, in addition to being suitable for those territories, has a low impact and is increasingly necessary in the economy of the national beer industry. The Central Apennines is the perfect example of how a territory that is less accessible from an agricultural point of view can be enhanced thanks to barley cultivation. Unlike durum wheat, malting barley does not require high protein content, thus limited fertilisation, and sanitary-wise it is very resistant to fungal attacks. Moreover, the possibility of growing it on marginal land has undoubted advantages from an environmental point of view, making it possible to bring back to production often abandoned land at low cost. In terms of quality and safety, all Italian malting barley cultivations are constantly monitored and assisted, day by day, with the use of highly technological tools such as, for example, agrometeorological sheds installed on the production areas or web assistance systems. By doing this it is possible to obtain an absolutely rigorous traceability of the basic raw material and a calculation of the agronomic sustainability of the product (AssoBirra, 2018).

4.3 The craft beer Italian market

Craft brewers and craft beer consumers have transformed global beer markets over the past two decades, ending a century of consolidation that resulted in the domination of a few global multinationals and the homogenization of beer. They started small and isolated but ultimately transformed the global beer industry and its market.

The craft beer revolution was preceded by a long period of consolidation and homogenization in the global beer industry that began in the late XIX or early XX century and lasted for most of the XX century. The reasons for this consolidation are well known:

- Technological progress such as acceleration of packaging, more automated brewing, conditioning processes, better distribution through improved road networks led to greater economies of scale.
- Bottom-fermented beers (Lagers) have higher fixed costs than top-fermented beers (Ales) because they require artificial cooling during fermentation and a longer maturation time. This caused smaller breweries using bottom-fermented beers to exit the market.
- Large-scale advertising and promotional activities led to increases in advertising costs. Brewers with a large-scale operation were able to advertise through expensive outlets, such as commercial television, has a significant marketing advantage.
- Global mergers and acquisitions contributed to consolidate the beer industry in the 1990s and 2000s, creating market-dominating global multinationals such as AB Inbev, SABMiller, Heineken, and Carlsberg.

The craft beer revolution, as a revolution precisely, came at the end of the dramatic transformation in the beer industry described so far. Industrial breweries chose product characteristics that appealed to as many consumers as possible, resulting in a more homogeneous and milder lager beer. As microbrewers consolidated, craft brewers began to enter the market, filling product niches left by the homogenization of industrial beers. Consumers, and the whole society too, began showing an increased interest in local products taking into account environmental and sustainability considerations and a rising sentiment against globalization (and related products of giant and multinational firms). The diffusion of organic foods, the spread of European certifications regarding geographical indications (such as Protected Designation of Origin, P.D.O. and Protected Geographical Indication, P.G.I.), the success of the farmer markets, and the Slow Food movement are a few examples of the results of these trends. The growth of the craft beer market is inherently associated with the growth in consumer desire for a non-standardized product that gives

the idea to be genuine and less environmental impacting as possible (Garavaglia and Swinnen, 2017). As it is possible to see from the Figure 4-4, the sector trend by number of active craft microbreweries was always growing from 2008 to 2016, with a slight stabilization in the two years 2017 and 2018. In the decade 2008-2018 in fact, craft microbreweries have more than quadrupled their number, passing from about 200 to more than 860, with an increment of +318%.

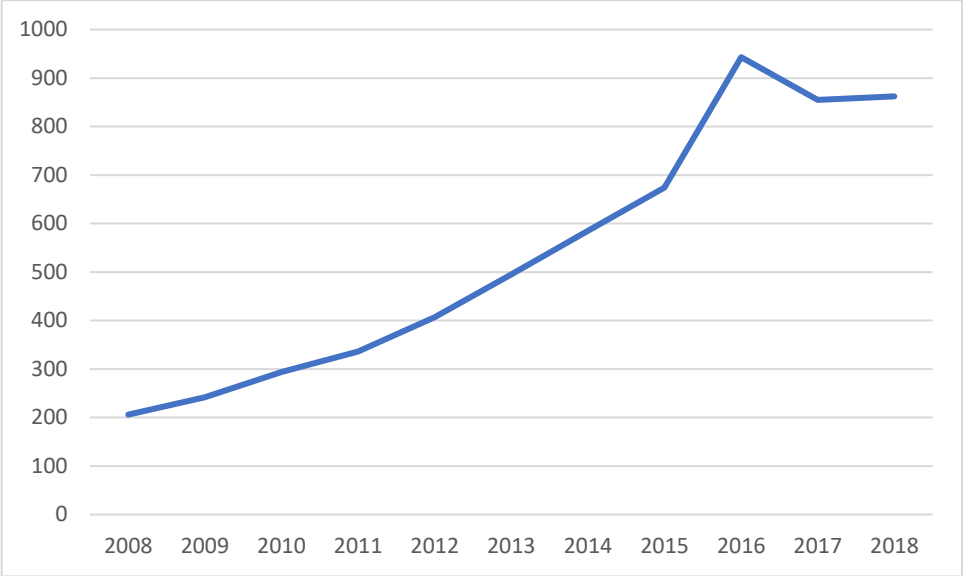

Figure 4-4: Active craft microbreweries trend (in number of active breweries, beerfirms excluded) (our elaboration on data AssoBirra, 2018)

The slowdown of the last year lied from the faction of craft breweries and brewpubs which both saw a slowdown in the positive trend of previous years, while beerfirms (excluded from Figure 4-4), maintained a good steadily positive trend. In Italy in 2018 there were about 1400 craft brewing companies (including craft breweries, brewpubs and beerfirms) (Microbirrifici.org, 2019). The peak recorded in 2016, when number of craft breweries grown from 674 of the year 2015 to 943, recording a +40% (+358% compared to the year 2008), represented a real "boom". The year 2017 saw a decrease in the number of active microbreweries, going from 943 as mentioned above to 855, recording a -9%, before stabilizing in the year 2018 (862 microbreweries). The craft beer boom now seems to be passed, but the sector is still growing, considering also the tax relief on excise duties for microbreweries that produce less than 10.000 hl per year starting from the 1st July 2019.

Over the past few years, the reality of craft breweries has become increasingly popular alongside large producers, which stand out for the "Italian" reworking of some beer styles and

for the creation of new varieties thanks to the imagination of Italian entrepreneurs and raw materials offered by the territory. Although microbreweries cannot compete with industry in terms of production volumes, they have nevertheless increased in number both in the Centre-North and in the South and in the Islands (Villatora and Bettiol, 2017).

The Italian region with the most facilities is Lombardy, which leads this special ranking with 147 organizations followed at a safe distance from Piedmont with 80 organizations and then Veneto (74) and Tuscany (63), while the Central-South region with the highest number is Campania, which has 55 breweries including craft breweries and brew pubs, in addition to a malthouses. The other one present in Italy as mentioned above is based in Lazio (AssoBirra, 2018; The Brewers of Europe, 2019; Unionbirrai and ObiArt laboratory, 2019).

In the face of the positive numbers of the beer sector analysed in Chapter II, also craft beer in 2018 recorded excellent numbers from the point of view of production and, consequently, consumption. The total quantity of craft beer produced in Italy in 2018 amounts to 504.000 hl, 21.000 hl more than the previous year, scoring +4,3%, continuing the constant growth since 2012. In fact, from 2012 to 2018 the quantities of craft beer produced in Italy were increased by 107%, with the most significant steps in the years 2015 (+21,9%) and 2016 (+12,9%). (Figure 4-5) These years, not surprisingly, correspond to the just mentioned boom of craft breweries opening. The market share of these microbreweries reached 3,1% in 2018 (AssoBirra, 2016 and 2018).

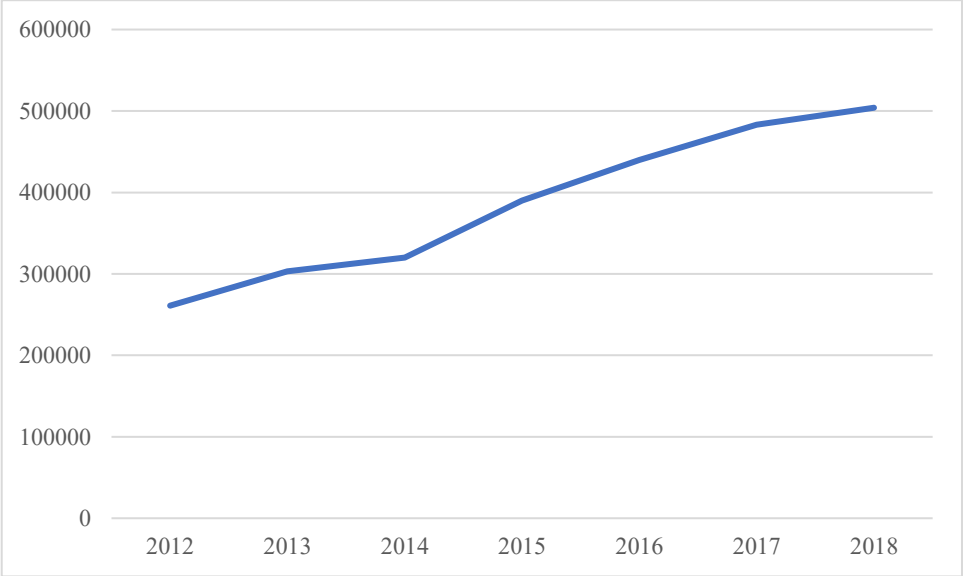

Figure 4-5: Hectolitre of craft beer produced in Italy (2012-2018) (our elaboration on data AssoBirra, 2016 and 2018)

Of the sparkling data that have been recorded in recent years in the beer sector, it is now clear how a substantial part of these increases derives from the craft compartment. The number of microbreweries present on the national territory has grown exponentially, production is growing and consequently consumption. As pointed out by various reports, above all by Unionbirrai, the data for the specific consumption of only craft beer from microbreweries are still difficult to find since, being a relatively new compartment (remember that until 2016 craft beer was not legally recognized) is currently being studied more in terms of production quantities and increase of companies operating in this sector.

Unionbirrai, indeed, focuses on the fact that the general growth of the beer sector is mainly due to craft beers. In fact, the increase in value of industrial beers in the period from 2014 to 2017 stands at just over 10%, while for craft products there is an increase of over 200% in value in the same period, and even a + 355% by volume. However, it should be specified that within these numbers, both craft beers from microbreweries and craft beers produced by industries are considered. This analysis therefore aims to emphasize the fact that the artisan sector, whatever its origin, is in any case growing, but at the same time underlining how this growth is largely attributable to industrial craft labels, confirming the aggressive commercial policy of the big producers who in just 4 years have entered the segment going from a sales volume of just over 320 thousand euros in 2014 (equal to 3,1% of the total craft sales in the large-scale retail trade) to about 15 million euros in 2017, reaching accounting for 46% of the total craft sales in this channel (Unionbirrai and ObiArt laboratory, 2019).

The growth of the craft beer sector and the entry in the market of increasing numbers of small brewers was enhanced by the growing availability of technical equipment and capital allowing brewing on a small scale. At the beginning of the history of craft beer, entrepreneurs faced major difficulties financing their breweries and finding appropriate equipment. The early craft brewers regularly used equipment designed for other industrial productions, such as dairy or wine, and adapted it to brewing and packaging or made use of contract brewing as an institutional mechanism to overcome capital and technology constraints. Today, instead, there is a rapidly developing market for craft brewing equipment. Similarly, as craft brewing revealed itself to be a profitable business, new sources of financing have developed and supported the start-up of new craft breweries. Banks became more familiar with the concept of craft brewing and started providing start-up capital. Crowdfunding has reduced entry barriers for starting up or expanding craft breweries. In addition, venture capital firms in the United States have determined craft brewing to be an interesting investment opportunity, and some regional authorities in Europe have begun providing public funds and incentives to start

craft brewing if connected to the development of the local agricultural activities (e.g., barley and hops) (Garavaglia and Swinnen, 2017).

Last but not least, another factor to analyse that further separates the two worlds of industrial beer from that of craft beer is certainly the sale price to the consumer. For example, it is possible to find Moretti and Peroni beer (famous Italian industrial beer companies) at the supermarket at a price that generally varies between € 0,89 and € 1,29 for a 66 cl bottle (1,35 – 1,95 €/l) and generally around € 0,70 for a 33 cl bottle (2,12 €/l). Taking now as a craft beer reference an already mentioned famous Italian craft brewery, it is possible to see that the cost of Baladin craft beer reaches € 3,50 for the 33 cl blanche "Isaac" and € 9,00 for the 75 cl Belgian Strong Amber Ale "Super" (respectively 10,61 and 12,00 €/l). The brewery in question also produces beer in Magnum formats (150 cl) sold for € 24 (16 €/l), as well as far more elaborate beers than the average, such as the 50 cl Xiauyu Barrel 2014, aged in rum barrels, available on the company's website for € 35 (70 €/ l) (Baladin brewery, 2020). The conclusion that craft beer is not a product for all budgets is easy to understand.

4.4 Craft beer legislation

Beer has been the subject of many government regulations that serve several objectives including enhancing government revenues through beer taxes, protecting consumer health, protecting society from alcohol abuse, reducing the price of grains for bread production and constraining market power. The growth of craft brewing has had two-way interactions with these regulations. On one hand, regulations have stimulated or constrained craft brewing compared to industrial breweries. Craft brewing has been hampered by restrictive regulations that were tailored to the mass producers, creating entry barriers for the first craft breweries. On the other hand, the growth of craft brewing has induced changes in regulations that have facilitated the subsequent entry of craft breweries. Legalizing homebrewing represented a key factor that facilitated entry of craft brewers in many countries (Garavaglia and Swinnen, 2017).

Agricultural breweries, as already anticipated, were introduced with Ministerial Decree n. 212 only in 2010. It was the first time that a different type of beer was recognized. According to this Decree, beer must not be qualified only as an alcoholic beverage, but as an "agricultural product" since the production of beer (but also of grappa, bread and other bakery products) is an activity related to agriculture. However, in order to be considered related activities, the main ingredients (such as malt, marc, flour) must be obtained mainly (at least 51%) from

products obtained on the farm. This means that the farmer must directly grow barley and activate the malting process using its own small, non-industrial, but nonetheless professional system to guarantee the health and quality of the beer or delegate it to a structure of which he is a partner. They can add aromatic elements using only products related to their territory and they cannot use preservative products in any way. This measure, which has the aim of promoting the diversification of agricultural business activities, has multiple advantages related not only to the possibility of indicating the status of agricultural brewery on the label, but also the opportunity to take advantage of a facilitated tax regime and to have access to European Union funding for rural development. In a nutshell, this type of brewery constitutes a kind of sub-group of craft breweries, which producing their own malt are classified as agricultural.

It was as a result of this movement that the COBI (Italian Consortium of Barley and Beer Producers) was born in Ancona in 2003; the only Italian consortium that brings together more than 80 farmers who, in addition to being barley farmers, are simultaneously producers of agricultural beer. In this consortium the producer members share the barley produced, obtaining traced and certified malt. To be precise, therefore, each brewery does not use only its malt but the malt produced by the entire consortium, which still allows you to maintain direct control over the production chain and product quality. The desire to differentiate the agricultural sector from the industrial one prompted the COBI to register the “Birragricola” trademark (Figure 4-6), the membership of which is reserved only to “farmers who produce beer with at least 70% of the raw material produced internally by the consortium, instead of 51% by law “ (COBI, 2020).

Figure 4-6: Birragricola trademark registered by COBI (COBI, 2020)

Agricultural breweries therefore constitute a subset of craft breweries, with the difference that the former, as farms, are subject to a taxation regime on a cadastral basis, less onerous than that of craft businesses (which instead pay income taxes). In general, the development of the craft beer sector has positive effects both for agriculture (for example, in terms of employment) and for the economy of the country, when compared with other types of microbreweries. A structural problem in Italy is represented both by the scarce surface cultivated with cereals to be used in the production of beer (which translates into a strong import of malt from abroad) and by the lack of malt factories (only 2 in Italy). It should be noted that Italy does not boast a centuries-old tradition in the production of beer barley (couplet barley) and hop cultivation, therefore it is probable that in the long term the country will continue to turn abroad for the purchase of raw materials. It is therefore wrong to consider agricultural beer qualitatively superior to craft beer because of the supply chain, thus penalizing other craft producers. Given that even breweries can produce quality beverages, it is important to clarify that the discrimination must be made in reference only to the skills of the master brewers, their collaborators and the quality of the raw materials used, not on the basis of the adjective ("agricultural" or "craft") which qualifies the brewery (Villatora and Bettiol, 2017). This is a very important aspect to be clarified and taken into consideration so that consumers are not misled and that they make choices dictated by their tastes and sensations, without however being conditioned a priori by a simple product name. A denomination does not determine the quality, which must be pursued through the quality of

raw materials, production processes and experience, loyalty and professionalism of the manufacturer.

Until 2016, craft beer did not have a precise legal definition. Until then, as we have seen, the beer sector had been neglected as regards the evolution of legislation, and consequently a less common and more niche product such as craft beer has suffered the most. With the definitive approval of the Italian Senate of the DDL S 1328-B of 6th July 2016, craft beer has finally its legal definition. Article n. 35 of the Law n. 154 of 28th July 2016 regarding simplification, rationalization, competitiveness for the agri-food sector, defines for craft beer the beer produced by small independent breweries and not subjected, during the production phase, to pasteurization and microfiltration processes. A small independent brewery means a brewery that is legally and economically independent of any other brewery, which uses plants physically distinct from those of any other brewery, which does not operate under a license to use the intangible property rights of others and whose annual production does not exceed 200.000 hectolitres, including in this quantity the quantities of beer produced on behalf of third parties (Law n. 154, 2016). This article intends to give a definition to the term "craft beer" linking it not only to the productive dimension of the breweries, but also to the kind of product they make and the techniques used for its realization. Finally, the need to be absolutely independent (legally and economically) from any other entity operating in the same sector is underlined. The following Article n. 36 is also relevant, in which, by promoting the development of a national hop supply chain, a specific support action is expressed in the craft brewing sector starting from the requalification of the raw materials it needs. Art. 36 shows that even at the regulatory level, there is a clear interest in the development of the craft beer supply chain not only by clearly and unequivocally defining the structures that can be included, but also by urging the local activation of the production of raw materials needed for the production process (Menghini, 2016). It is a very important date and a very important success for the craft beer sector and movement: for the first time, Italian legislation underlines the difference between microbreweries and large industrial plants, so far compared on the same levels of taxation and complexity of compliance. For those who respect all the requirements it is now possible to write on the label "craft beer". In this case, beers industrially produced by multinationals will no longer be able to use this term.

Basically, the legislator built the definition of craft beer on that of craft brewery. In other words, "craft beer" is said to be the beer produced by a company that meets certain technological, quantitative and structural criteria. The law therefore requires to focus not on the product but on the characteristics of the manufacturer. The amendment does not say

anything about the raw materials used: it is a “regulatory hole” that could favour the use of substitutes. In this regard, it is noted the absence of obligations on the use of local raw materials and on permitted chemical additives and/or preservatives. The new law does not contain specific articles that regulate the use of hops; therefore, it is not possible to infer the craftsmanship of the product from its local origin. The production of hops on the national territory is in fact not yet sufficient to satisfy the producers’ requests (Villatora and Bettiol, 2017).

CHAPTER V
A CASE STUDY ON CRAFT BEER: CONSUMERS' AND BREWERS' PERCEPTIONS

5.1 Introduction

The craft beer sector, as well as any other sector that from niche becomes public domain, is absolutely fascinating and attracts the attention of consumers as confirmed by the 2018 market numbers. The world of craft beer is as complex as it is intriguing, so vast as to get lost inside. This enormous vastness can be seen from two points of view: extreme differentiation or extreme confusion.

The aim of this study is twofold: firstly, analyse the choices that lead the beer consumer to buy craft beer; secondly, the choices made by the major craft beer producers of the Marche region in producing their precious product. In particular, the investigation will allow outlining the profile of the typical Italian craft beer consumer and the typical craft beer producer of the Marche Region. To achieve this goal and to collect data, two different surveys, have been created. Through the analysis of the results, it will be possible to intersect the two worlds, that of the production and that of the consumption of craft beer in order to analyse contact points, points of divergence, misunderstandings and anything that may emerge.

5.2 Method of analysis

The research was carried out with two questionnaires, one referred to Italian consumers habits and one referred to the owners of the craft beer production plants in the Marche Region. The whole two questionnaires are available respectively in Annex I and Annex II.

The data collected through the two questionnaires have been treated in an absolutely anonymous way and will be shown in graphs only in aggregate form. If the use of online survey brings with its numerous advantages such as the speed of diffusion, the ease of creating the database with the answers and the ease of processing, on the other hand it makes it impossible to reach people who do not have this technology. In addition to this risk, it is possible that the sample is not very representative of the reference population, but through a

wide survey (open for almost a year), we were able to collect the main characteristics of the population and to have a well differentiated representative sample on all the socio-demographic plan.

5.2.1 Consumers questionnaire

The consumers questionnaire explores knowledge, preferences and consumption habits related to drinking beer people. Personal features of interviewees were also collected. People were asked to participate and instructions on how to compile the questionnaires were provided online; no incentives have been offered whatsoever for participating in the survey.

This first questionnaire contains 23 questions including 15 closed-ended, 6 multiple-choice and 2 open-ended questions and can be divided into 3 main section:

1- Socio-demographic characteristics of the participant;
2- Consumption habits for drinking craft beer;
3- Preferences for drinking craft beer and Likert scale to attribute a value to each factor that describes craft beer

In the first section, some personal and socio-economic information was requested from the interviewee, in particular he/she is asked to indicate: age, gender, educational level, employment, marital status, family size, family's annual income class, region of residence and place of residence (urban or peri-urban areas).

The second section contains 3 barrage questions and starts with one of them. The interviewee is asked if he/she consumes beer. In the case of an affirmative answer, the interviewee moves on to the next question, otherwise, he/she will have completed his/her questionnaire. The following questions concern the knowledge and consumption of craft beer. If the interviewee does not know craft beer his/her questionnaire end. The interviewee is also asked for a definition of what craft beer represents for him/her (open question). If the interviewee does not consume craft beer (third and last barrage question), through a multiple-choice question he/she is asked for what reasons he/she does not consume it before finishing the questionnaire. Analysing consumption habits, the interviewees were asked how long they have been drinking craft beer, how often, in what places and on what occasions, where they buy it and what are the factors that lead them to buy this craft product rather than industrial beer.

The third and final section of the consumer questionnaire is aimed at investigating the preferences of consumption of craft beer. These factors just mentioned were then weighed by the interviewee on a Likert scale from 1 to 5 where 1 corresponds to not at all important and

5 to very important. The Likert scale is a technique elaborated by the American psychometric Rensis Likert in 1932, applied today as one of the most fundamental and frequently used psychometric tools in scientific research (Joshi *et al.*, 2015). The most used Likert scales are generally composed of factors weighed on 5 or 7 points that express the (dis)agreement to a given proposition. According to several studies, the subjects analysed in a questionnaire with questions of this type, discriminate well between only two categories of disagreement (one moderate, 2; and one extreme, 1), while they tend to overlap if there are more than two (in the case of a 7-point scale). For this reason, in agreement with the creator of the aforementioned scale, we decided to prefer scales at 5 instead of 7 points (Marradi and Macrì, 2012).
In this way, the interviewee was able to express himself/herself and give the importance he/she considered most correct to each of the 15 factors that describe the product under analysis. The scores attributed to each factor for each proposition coincide with the labels for the affirmations in favour: 1, 2, 3, 4, 5. These numbers add up to assign each subject a total score based on his/her reactions to the various sentences of the scale, in order to quantify his/her (supposed) state on the property that the scale intends to detect. The final score of each factor is given by the sum of all the partial scores corresponding to each choice made between the propositions that make up the staircase.

Before concluding the questionnaire, consumers of craft beer were asked to indicate by multiple response the spaces in which they see / have seen advertisements for craft beer and to indicate, through an open question, the craft beers they usually consume.

5.2.2 Craft brewers questionnaire

The second questionnaire is composed of 39 questions including 14 closed-ended, 8 multiple-choice and 17 open-ended questions and can be divided into 6 main section:

1- Socio-demographic and economic characteristics of the craft brewery
2- Raw materials characteristics, origins and special ingredients
3- Marketing choices and product advertising
4- Likert scale to attribute a value to each factor that describes craft beer
5- SWOT analysis
6- Socio-demographic characteristics of the craft brewery owner

In the first section some details about the brewery and some data about production and revenues referred to the year 2018 were collected. The name and location of the brewery, type of brewery, number of employees, turnover class, hectolitres of beer produced, number of

types and type of beers produced were the questions that were initially asked to the owners of the Marche Region craft breweries.

The second section start investigate the choices and why these choices were made by producers in terms of raw material selected and raw material provenience.

The third section investigate the choices made in terms of selling their product (sales channels, sales formats, exports etc.) and advertising.

Very important is the fourth section, namely the part relating to the choice of the 3 main factors that the master brewer considers most important for the production of his beer. As for consumers, the producer is also asked to weigh all the 9 factors that have been proposed to him on a scale of values ranging from 1 to 5 where 1 represents not at all important and 5 very important. This will allow us to cross the expectation of the consumers (what they are looking for in a craft beer) with the aspirations and objectives of Marche Region craft beer producers (what they want to make emerge from their beers and from their art in brewing beer) so that it can be possible to have an idea of the relationship between the world of consumption and that of production. It will be possible to understand if the two sides of the same coin are completely understanding each other during the evolution of the sector and especially if the producers understand and are/are not interested, about the consumer's preferences on their product.

Fifth section regard the SWOT analysis. SWOT analysis is an effective framework for analysing the Strengths, Weaknesses, Opportunities, and Threats of an organization (or a project) that helps to address the effectiveness of a project planning and implementation (Sabbaghi and Vaidyanathan, 2004). The SWOT analysis is a reasoned analysis of the sectoral or territorial context in which an intervention program is carried out. The purpose of the analysis is to define the development opportunities of a territorial area or of a sector or area of intervention, which derive from an enhancement of the strengths and a containment of the weaknesses in the framework of opportunities and risks that normally derives from the external economic situation. This analysis allows to focus attention on the critical elements of the factual situation of the places concerned, or on the issues that are decisive for making decisions (Rostirolla and Rostirolla, 2008). This tool can be considered as a strategic planning that is concerned with the content and the objectives of the organization or of the project, and with identifying the right things to do. What is right depends on the specific interface between the project, the objectives it serves, and its environment (target groups, market, law and regulations, etc.). Strengths define any internal asset (expertise, motivation, technology, finance, business model, etc.) that will help to meet demands and to fight of threats. Weaknesses describe internal deficits (lack of motivation, lack of transport facilities, problems

in distribution of services or products, low reputation, etc.) that hinder the organization in meeting its demands. Opportunities describe any external circumstances or trends that favour the demand for an organization's specific competence. The project's success probability depends on whether its strengths not only match the key success requirements for operating in the target environment but also exceed of those of project threats. Threats define any external circumstance or trend (establishment of strong competitors, government deficit, or regulations that limit free distribution of our products or buying our services, etc.) that will unfavourably influence demand for an organization's competence (Sabbaghi and Vaidyanathan, 2004). Table 5-1 summarizes some of the key questions and typical answers in each area grouping factors that internally depend on the organization and those external to it.

Table 5-1:SWOT analysis summary (Sabbaghi and Vaidyanathan, 2004)

		Key Questions:	**Typical answers**
Internal	**Strengths**	What are our advantages? What do we do well?, How are we doing competitively? What are our resources? Are there any internal assets (know-how, motivation, technology, finance, business links) which will help to meet demands and to fight off threats?	Well-trained man-power , well established knowledge base, good contact to target group, technology, etc.
	Weaknesses	What could be improved? What is done badly? What should be avoided? Are there any Internal deficits hindering the organization in meeting demands?	Lack of motivation, lack of transport facilities, problems in distribution of services or products, low reputation (the lack of a particular strength)
External	**Opportunities**	What are the good tasks? What are the interesting trends? What changes do we expect to see in the market over the next few years? Are are any external circumstances or trends that favors the demand for an organization's specific competence?	Changes in technology and market that favor your products or services, changes in government policy related to your industry, changes in social patterns, population profiles, lifestyle, etc., local, national, & international events increasing purchasing power.
	Threats	What is our competition doing? What are the obstacles? What future changes will affect our organization? Is changing technology threatening our position? Do we have management support? Sufficient resources? Are we using the right tools, software, and platform? Are there any external circumstances or trends which will unfavorably influence demand for an organization's competence?	Establishment of strong competitors, lack of cash at household level, governmental regulations that limit free distribution of our product.

The final section of the second questionnaire concerns the socio-demographic data of the owner of the production plant (age, gender, educational qualification, reasons that led him to appear in the world of craft beer) which will then serve to outline the typical craft beer producer of the Marche Region.

5.3 Results

In the following section, the main results obtained from the two different surveys are analysed.

5.3.1 Consumers questionnaire results

Data were collected from June 2019 to May 2020, the surveys were conducted via web with the Google survey platform "Moduli". People for consumers questionnaire were reached and invited via different social networks (mostly Facebook and WhatsApp) starting with a small group of friends and progressively enlarging the number of contacts. The sample used for the purpose of the present analysis is of 455 people.

Regarding beer consumers, 51,2% of the sample was found to be female. As for age, 44% of the people participated to the survey are between 18 and 25 years old, 33,6% between 26 and 41 years old, 17,3% between 41 and 60 years old and the remaining 5,1% are over 60 years old.

Regarding the qualifications obtained, 46,6% have a degree, 42,7% have a high school diploma, 8,1% have a post-graduate education and 2,6% have a middle school diploma. The high schooling rate of the sample indicates an increase in the financial resources and, consequently, in the possible level of expenses (Istat, 2019). 44,2% of the interviewees are employed, 38,7% are students, 11,5% are freelancers, 3,6% are unemployed and 2% are pensioners.

Most of the people who participated to the questionnaire are unmarried (71,6%) however, it is found a strong variability in the size of households. The 11,8% live alone while the most common number of family size is 4 (38,7%) followed by 3 (19,8%), 2 (16,7%), 5 (8,4%), 6 (3,7%), 8 (0,7%) and 7 (0,2%).

28,6% of the sample has an annual household income between € 21.000 and € 35.000, 23,7% between € 11.000 and € 20.000 and another 23,7% between € 36.000 and € 50.000. 9,7% have an income between € 51.000 and € 75.000, 8,4% less than € 10.000 and 5,9% greater than € 75.000.

The main area of residence is urban, with 71%. The sample is distributed throughout the national territory, with particular concentration in the Marche Region, which represents 63,1%. The concentration of the sample in this region is linked to the place of launch of the questionnaire and the methods of administration. The other most represented regions are Lombardy, with 4,8%, Veneto and Emilia-Romagna, with 4,6%, Lazio with 3,3% and

Piedmont, with 3,1%. (Figure 5-1) Table 5-2 shows the results of the socio-demographic analysis of the sample in detail.

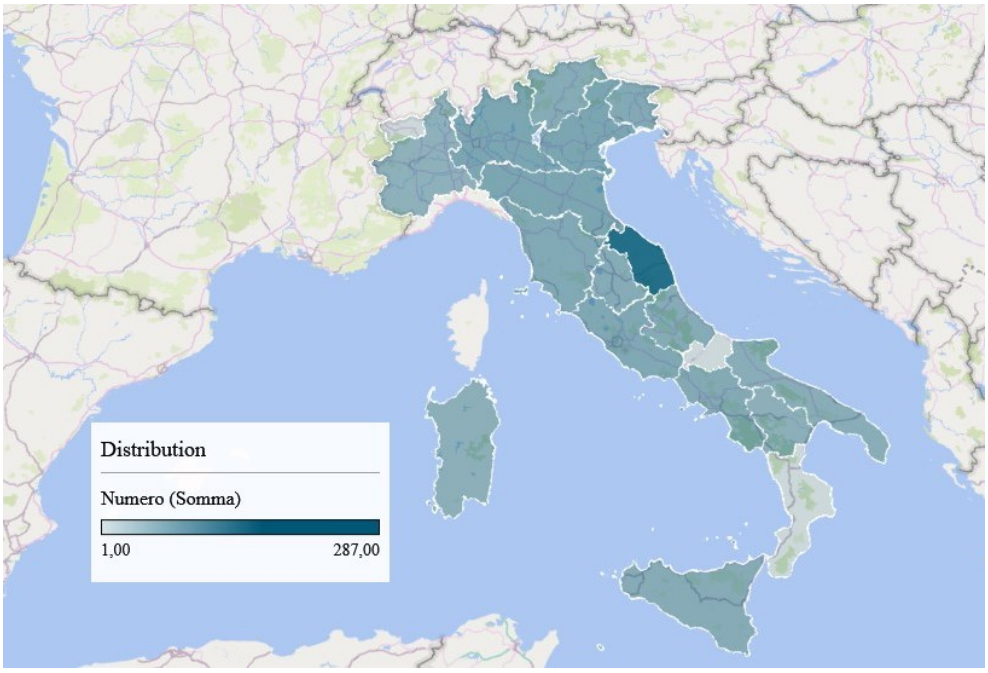

Figure 5-1: Distribution of the sample on the national territory

Table 5-2: Summary of socio-demographic data

DATA	DESCRIPTION	PERCENTAGE
Age	18-25	44%
	26-40	33,6%
	41-60	17,3%
	60+	5,1%
Gender	F	51,2%
	M	48,8%
Educational qualification	No formal education	0%
	Primary school	0%
	Middle school	2,6%
	High school	42,7%
	Degree	46,6%
	Postgraduate education	8,1%
Occupation	Student	38,7%

	Housewife	0%
	Employee	44,2%
	Freelancer / Self-employed	11,5%
	Unemployed	3,6%
	Pensioner	2%
Marital status	Unmarried	71,6%
	Married	28,4%
Family size	1	11,8%
	2	16,7%
	3	19,8%
	4	38,7%
	5	8,4%
	6	3,7%
	7	0,2%
	8	0,7%
Annual household income class	< € 10.000	8,4%
	€ 11.000 - € 20.000	23,7%
	€ 21.000 - € 35.000	28,6%
	€ 36.000 - € 50.000	23,7%
	€ 51.000 - € 75.000	9,7%
	> € 75.000	5,9%
Residence	Urban	71%
	Peri-urban	29%

Analysing beer consumption, 87,7% of the sample consumes beer and 91,7% of this, knows craft beer (Figure 5-2).

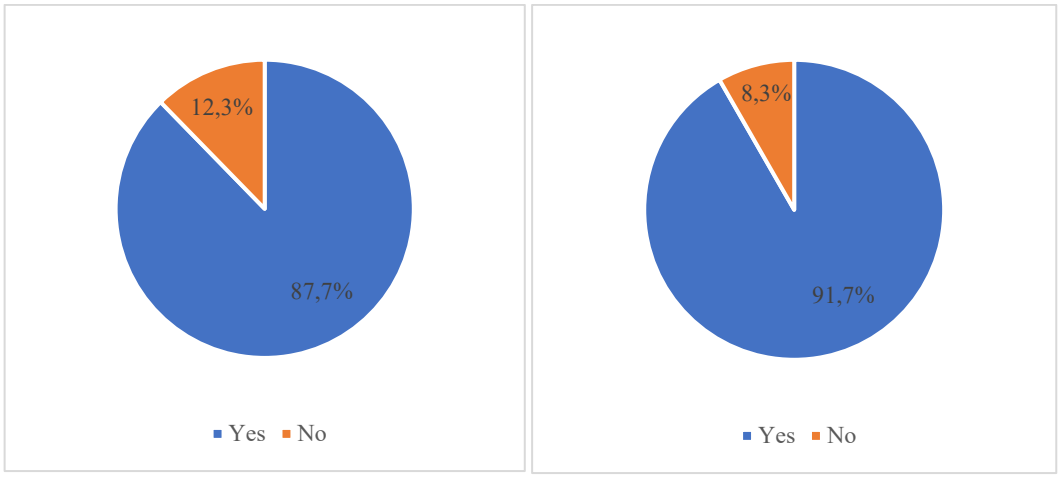

Figure 5-2: Beer consumption and craft beer knowledge of the sample

After the question about the interviewee's knowledge of craft beer, he/she was asked to describe what craft beer is for him/her. The answers have been elaborated and schematized by us in the graph in Figure 5-3. 42,4% of the interviewees replied by paying attention to the fact that for them craft beer is the one produced on a small scale, by independent breweries and that has nothing to share with industrial beer in terms of production quantities and distribution of the finished product. For 18,3% of people who consume craft beer, the superior quality of craft beer compared to industrial beer represents the most important characteristic that determines their definition. 5,7% of the answers to this open question were not taken into consideration as the interviewees knew about craft beer but were unable to define it. The other more popular answers have focused attention on the production process but also on the naturalness and genuineness of craft beer, on being a different product, a novelty, a good drink, pleasant and refreshing to be consumed together in social moments.

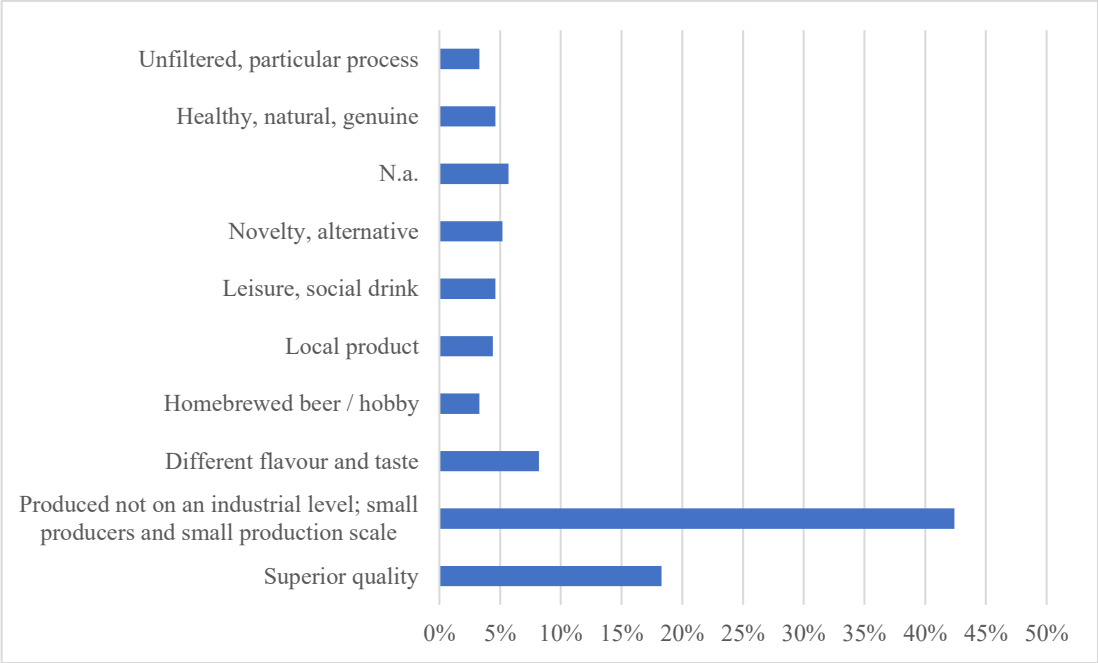

Figure 5-3: What craft beer represent for the interviewees

86,6% of the subjects who know craft beer, consume craft beer. These will be the real samples for our specific analysis on the consumption of craft beer, equal to 317 people. Such high figures are further confirmation of how craft beer in recent years has become common knowledge and a very popular drink among beer consumers. By contrast, 13,4% of the people knowing craft beer do not consume it and to them were asked the reason why they do no consume this product. Answers were organized and showed in Figure 5-4.

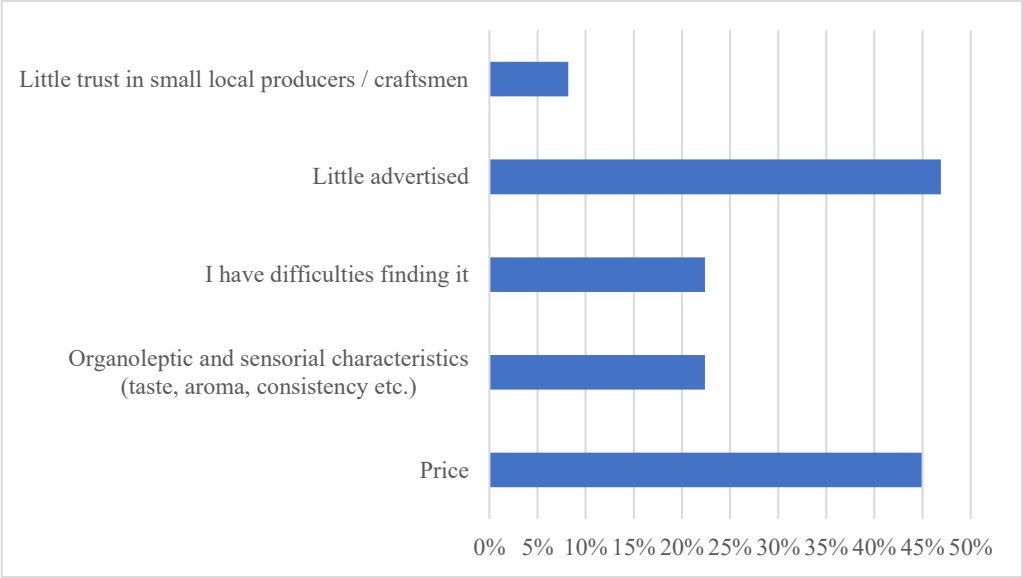

Figure 5-4: Reasons why people who know craft beer do not consume craft beer

44,9% of people who don't consume craft beer blame the selling price, another 46,9% for the lack of advertising. The lack of appreciation of the organoleptic and sensorial characteristics of craft beer, the scarce availability on the market and the lack of trust towards small independent producers complete the picture. 35,3% of participants have been consuming craft beer for 3-5 years, 30,3% for 1-2 years, 28,1% for more than 5 years and the new consumers that consume beer for less than 1 year correspond to 6,3% of the sample (Figure 5-5).

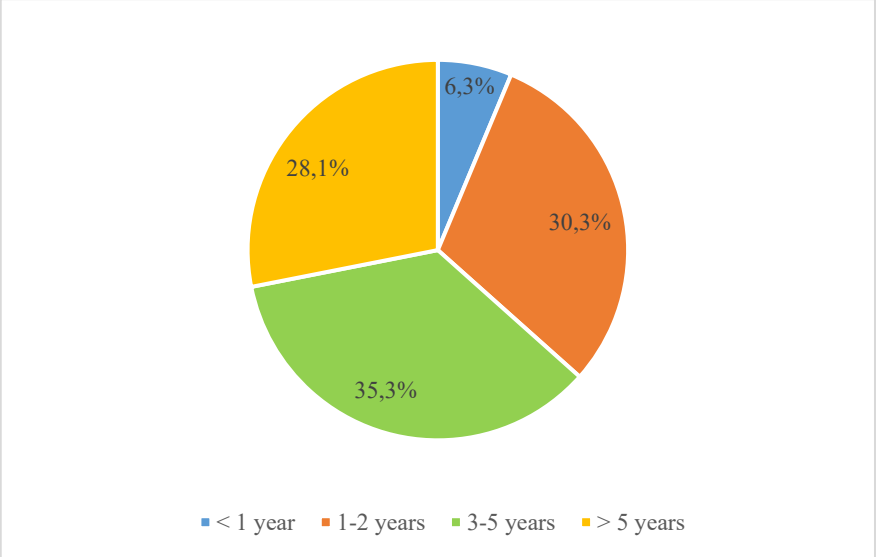

Figure 5-5: How long have sample consumers been drinking craft beer

63,1% of the interview drink craft beer occasionally (1-2 times per month) 27,4% infrequently (1 time per week), 8,2% frequently (several times a week) and 1,3% consume craft beer on a daily basis (Figure 5-6).

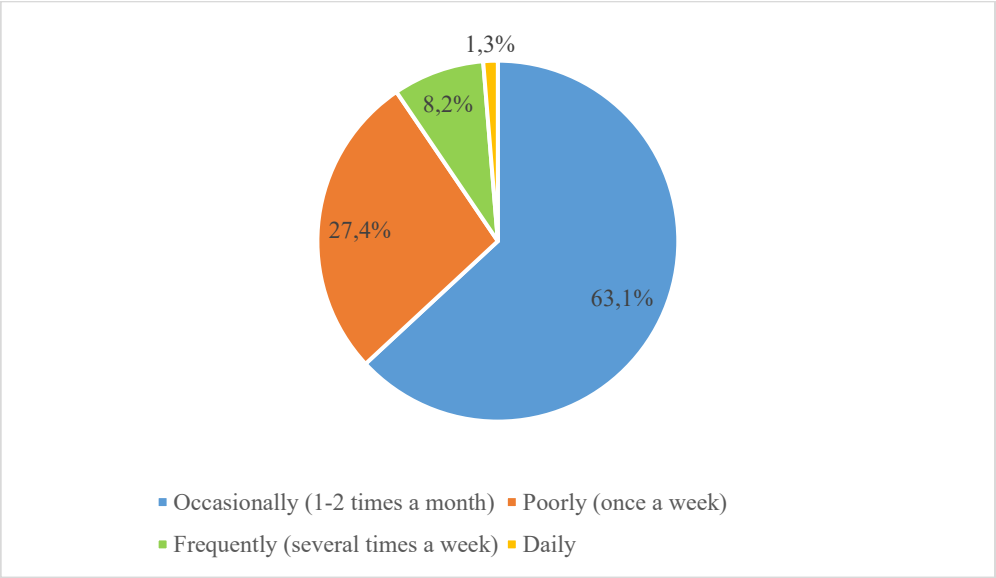

Figure 5-6: Frequency of craft beer consumption of the sample

54,3% of the people consume craft beer outside home and 38,2% both inside and outside home. 71.9% of people who drink craft beer, consume it during outings, 41.3% during meals, 30.3% during parties and 29.7% in special occasions (Figure 5-7).

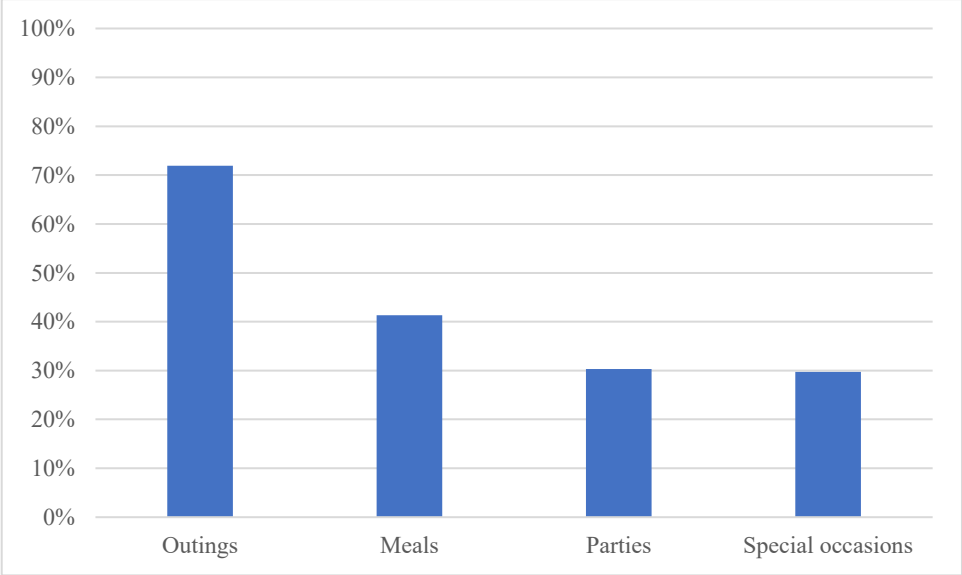

Figure 5-7: Craft beer consumption moments

Regarding the points of purchase of craft beer, 71,3% of respondents buy the product at the bar / pub / beer house, 26,8% at the supermarket, 26,2% directly in the brewery, 25,6% at the restaurant / pizzeria. 11,4 % of people turn to specialized stores (beershops), while 6,6% buy at the brewpub and 2,5% on the internet (Figure 5-8).

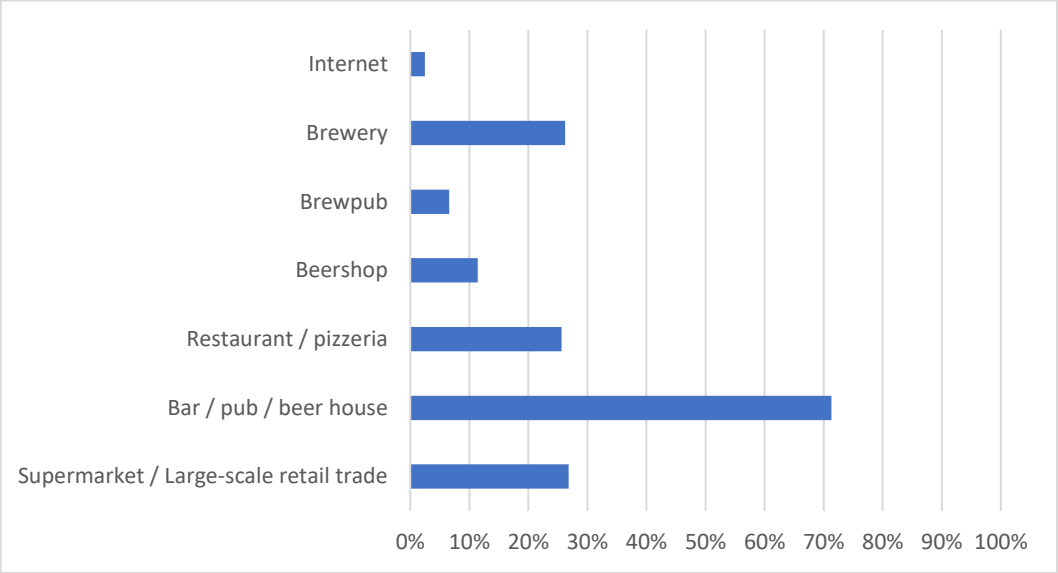

Figure 5-8: Places of purchase

From the results of the qualitative analysis, in which consumers were asked to choose 3 of the 15 factors that were proposed to them regarding the reasons why they prefer to buy craft beer instead of industrial beer, it results that the top 3 voted factors by big difference with others are the richest and less standardized taste, the superior quality compared to industrial beer and the local origin / link with the territory. All the other results are shown in detail in Figure 5-9.

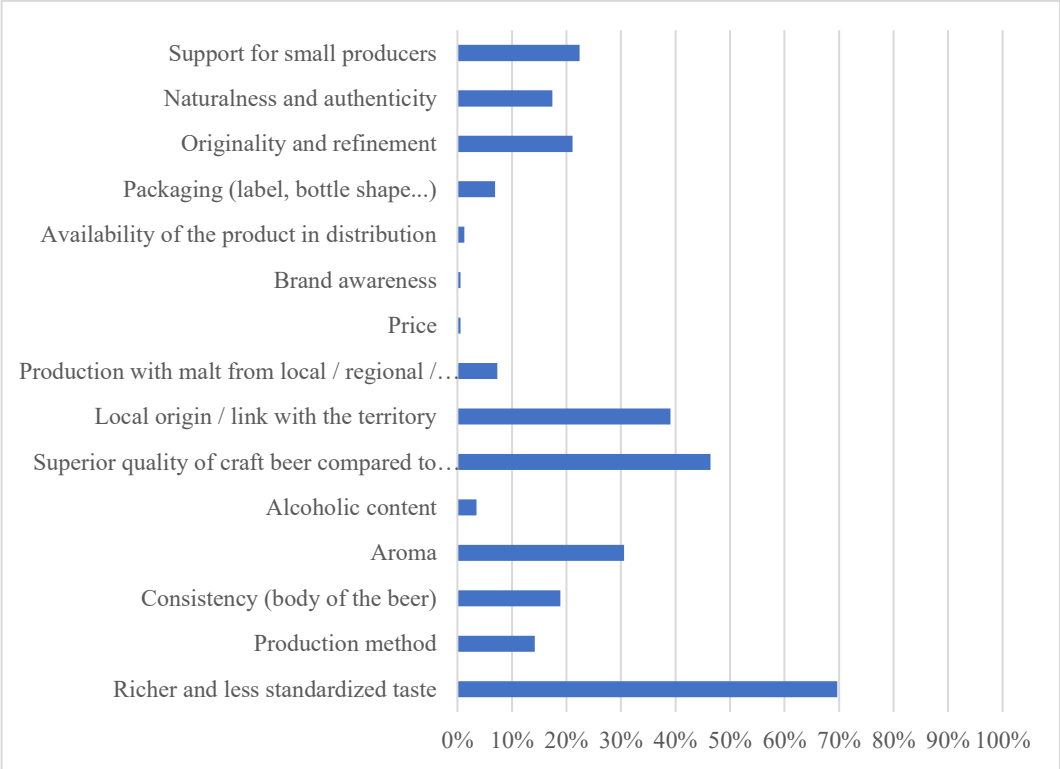

Figure 5-9: Purchases determining factors

Subsequently, it was asked to attribute to each factor a score on a Likert scale from 1 to 5 (where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important) to determine the effective impact on the choice of consumers.

From this quantitative analysis, the attribute "richer and less standardized taste" was indicated as very important by 51,4% of the sample and important for 39,4%, in line with the qualitative analysis. The production method was found to be important for 43,2%, very important for 25,9% and indifferent for 21,5%; similar results were obtained from the consistency (body of the beer). As for the aroma, 42,9% of the sample considers it an important factor and 39,7% very important. The alcohol content is indifferent for 40,1%, not important for 21,8% and important for 15,8%. The "superior quality of craft beer compared to industrial beer" factor was very important for 54,3%, important for 27,8% and indifferent for 12,3%. Similar result was obtained from the "local origin / link with the territory" factor but with 17,4% of indifferent to the detriment of the very important value, definitively confirming the correspondence with the qualitative analysis. The production of beer with malt from local / regional / national cereals was important for 35,3% of the sample, very important for 29%, indifferent for 20,5% and not important for 11,4%. Another very important factor, if not the most important as far as the market is concerned, is the price which results indifferent for

37,5% of the sample, important for 27,1%, not important for 16,4% and very important for 13,2%. Considering that the price is one of the major reasons why 13,4% of the sample who knows craft beer does not consume it, we can see how it is not too important compared to other factors for the more or less habitual consumers of craft beer. Even the packaging of craft beer has had more or less the same results as the price with 36,6% of the sample being indifferent to the appearance of the bottle, the label, etc., while 24% considers it important, not important for 15.8% and not at all important for 12,3%. Even the brand's reputation does not seem to be of great interest to the majority of craft beer consumers who consider it to be not at all important for 25,2%, not important for 35,3%, indifferent for 27,4%. The product availability factor, on the other hand, is very important for 8,5% of the sample, important for 35,6, indifferent for 33,1%. Things change quite clearly when we go to analyse the last 3 remaining factors namely originality and refinement, naturalness and genuineness, support for small producers. The latter is very important for 46,7% of the sample, important for 31,9%, indifferent for 14,8%. The other two factors respect more or less the same trend which is important for 40% of consumers, very important for 33% and indifferent for 18%. Results of the quantitative analysis are summarized in Figure 5-10.

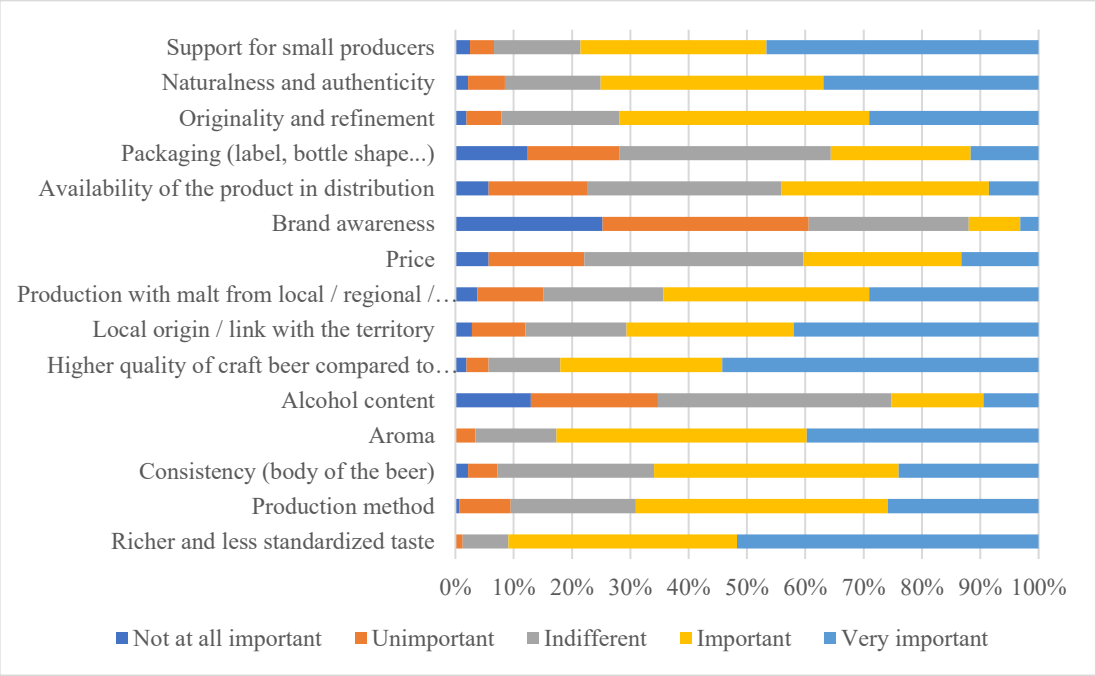

Figure 5-10: Summary of the quantitative analysis

To investigate the effectiveness of craft beer communication and advertising, consumers were asked to indicate a maximum of two channels through which they happened to see craft

beer advertising. A good part of consumers has seen advertising / sponsorship of breweries on social networks (Facebook, Instagram, etc.), while about half of consumers have never seen advertisements for craft beer (Figure 5-11).

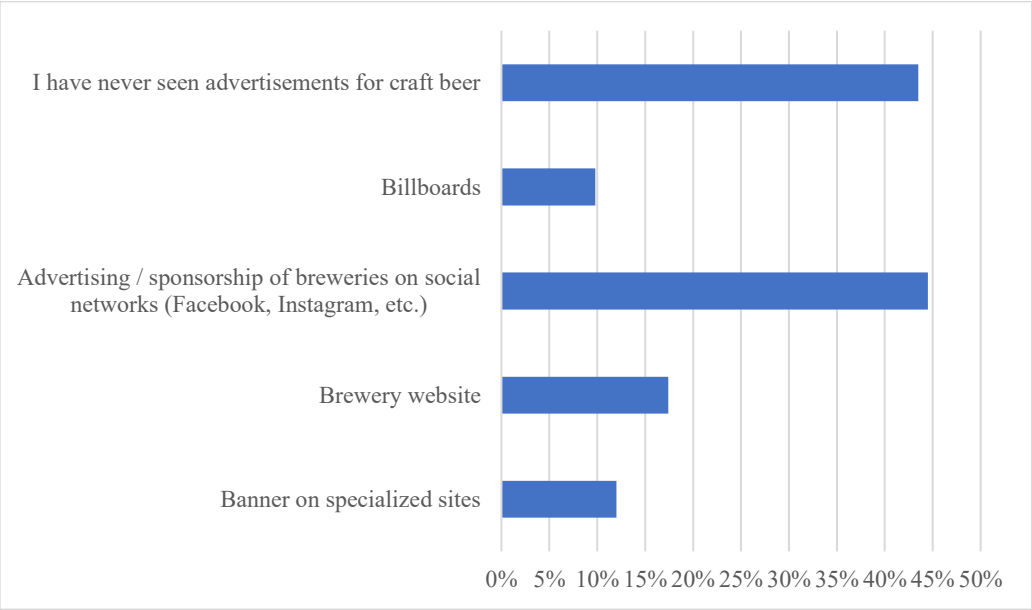

Figure 5-11: Where craft beer consumers see craft beer advertising

The last question in the consumer questionnaire was optional, despite which 66% of consumers answered. This question wanted to investigate whether consumers of craft beer remember the name of the craft breweries of which they usually consume craft beer. 81,9% of these listed craft breweries, while 11% failed to remember the name of the breweries of which they consume craft beer, some because they vary very often. The remaining 7,1% confused some industrial beer brands with those of craft breweries, highlighting the confusion in their idea of craft beer, although they mentioned Italian and foreign beer brands which, even if they are industrial, are considered all over the world of higher quality than the average of industrial breweries.

5.3.2 Craft brewers questionnaire results

Even for the second questionnaire, for the reaching of breweries owners' different social network were used in order to invite them to participate to the research. 23 Marche Region-based craft breweries participated to the survey.

Regarding this questionnaire addressed to the craft beer producers of the Marche Region, 43,5% of the breweries that answered the survey are based in the province of Ancona, 21,7% in the province of Macerata, 17,4% in Pesaro-Urbino, 13,1 % in Fermo and the remaining 4,3% in the province of Ascoli Piceno (Figure 5-12).

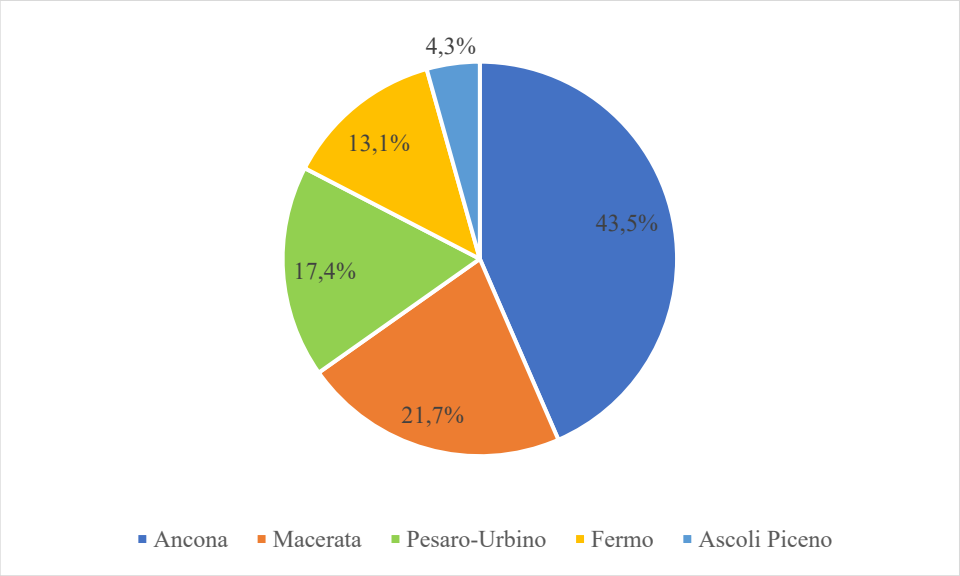

Figure 5-12: Distribution of the sample of breweries along the Marche Region

The most common types of microbreweries are the craft brewery and the brewpub which cover respectively 34,8% and 26,1% of the total sample, followed by 21,7% of the microbreweries which are beerfirms and 17,4% are agricultural breweries which as we have previously seen are the subclass of craft breweries with multiple production restrictions (Figure 5-13).

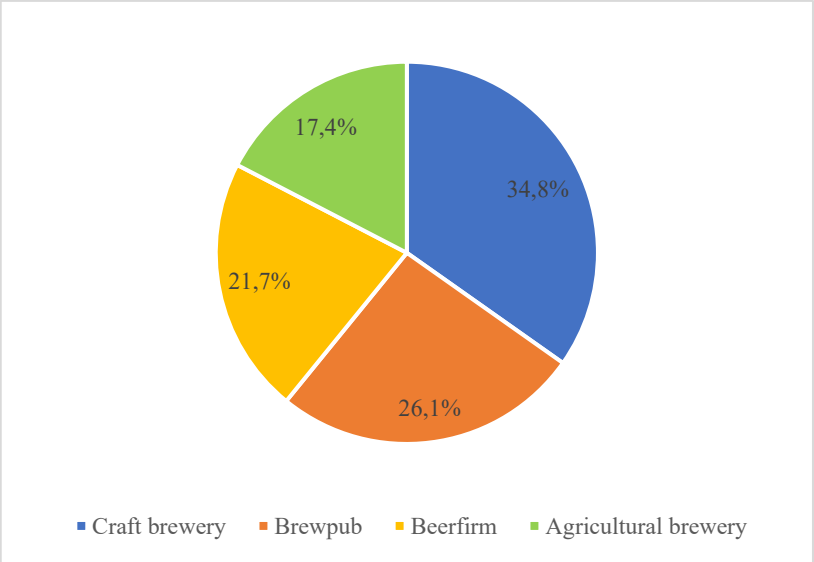

Figure 5-13: Types of microbreweries

Most microbreweries under analysis (56,5%) have a limited number of employees (between 1 and 3) and 30,5% have no employees. Only 8,7% of the sample have more than 5 employees and 4,3% of the sample have between 4 and 5 employees (Figure 5-14).

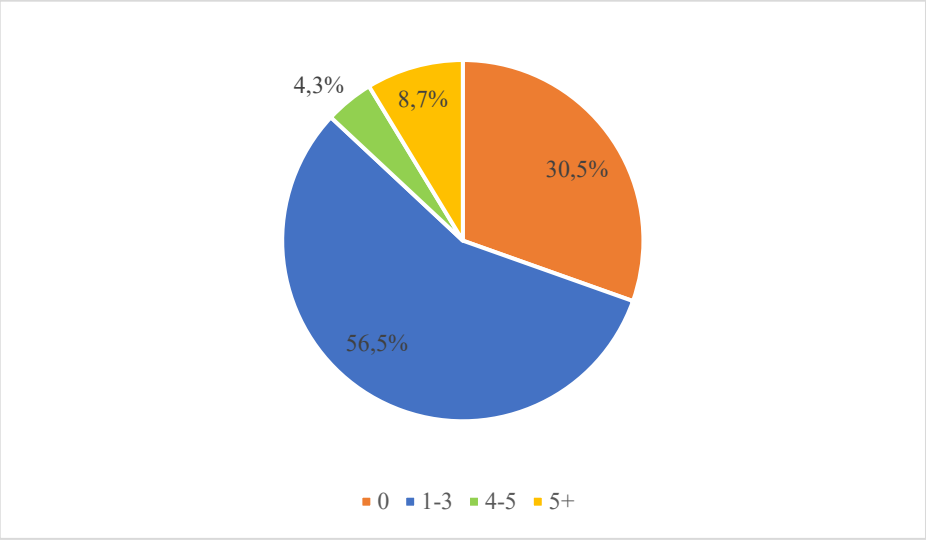

Figure 5-14: Employees number of the craft microbreweries sample

Most microbreweries have been founded in the last 5 years, confirming the positive trend of openings in Europe as well as in Italy and the highest point of the craft beer boom just passed. In fact, 65,3% of the breweries interviewed have opened their doors since 2015, marking a real change of trend compared to previous years. 2015 and 2016 marked a very

important two-year period with 30,5% and 26,1% respectively of the openings of the sample analysed (Figure 5-15).

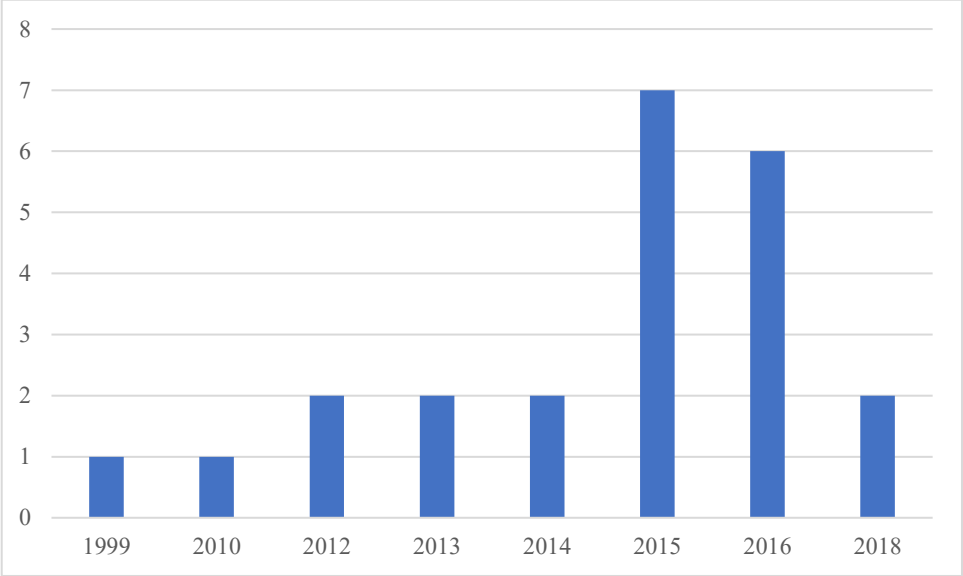

Figure 5-15: Foundation year of the microbreweries under analysis

The production of craft beer varies greatly between the sample going from a minimum of 20 hectolitres to a maximum of 15.000 hectolitres. The results for the hectolitres of beer produced can be grouped as follows. 34,8% of the sample in the year 2018 produced a quantity of beer within 100 hl, 30,5% between 100 and 500 hl, 21,7% between 500 and 1000 hl while 13% produced more than a thousand hectolitres (Figure 5-16).

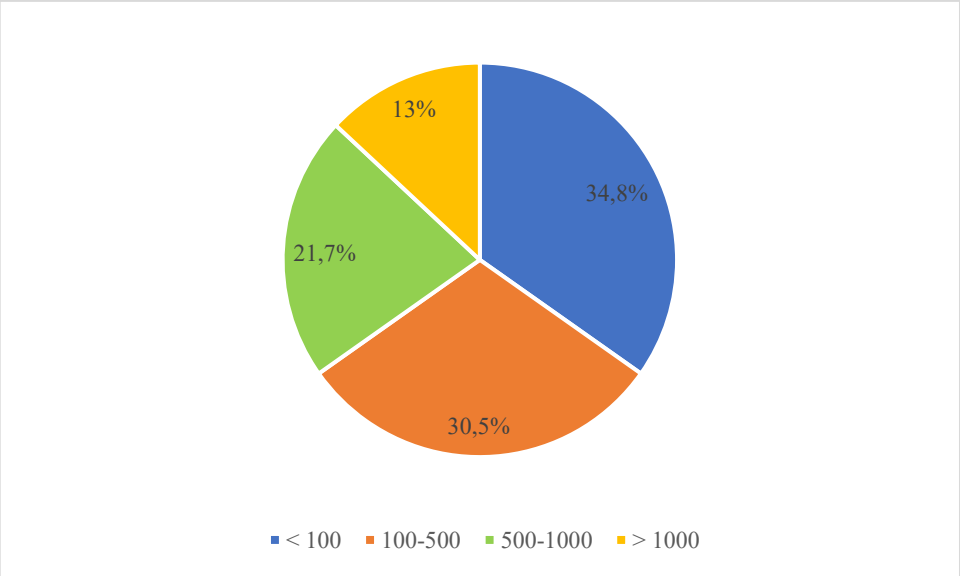

Figure 5-16: Quantity of beer produced in 2018 by Marche Region craft microbreweries (in hl)

The turnover classes vary a lot, as we have seen the dimensions of the various microbreweries (based on the number of employees) and the activities carried out (based on the number of hectolitres produced in the year 2018). 26,1% of the sample has a turnover (referring to 2018) between € 50.000 and € 100.000, 17,4% between € 100.000 and € 250.000, 17,4% between € 250.000 and € 500.000, another 17,4% up to € 25.000, a 13% between € 25.000 and € 50.000 and a last 8,7% has a turnover of over € 500.000 (Figure 5-17).

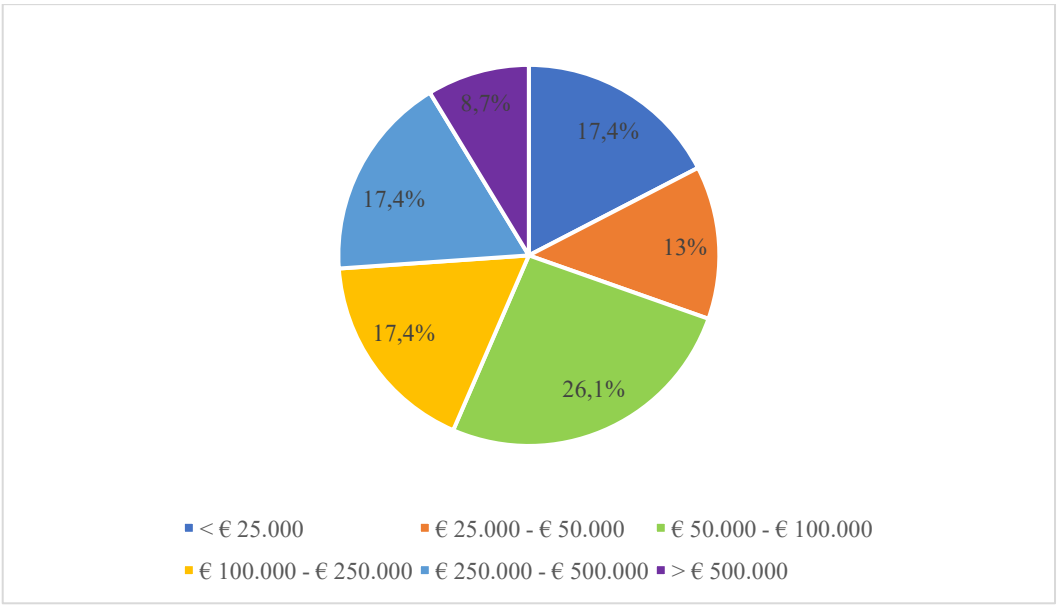

Figure 5-17: Turnover class of the sample

The number of types of beers produced also varies greatly, from a minimum of 1 to a maximum of 25 different types, with 21,7% of the breweries producing 5 different types of craft beer, a 13% that produces 12 and others 8,7 % that produces 6, 7, 10 different types of craft beer. Ultimately, we can say that 65,2% of the sample produces up to 10 different types of beers, 30,5% produces a number of beers between 10 and 20, while only 4,3% of the sample produces more than 20 different types of beer (Figure 5-18).

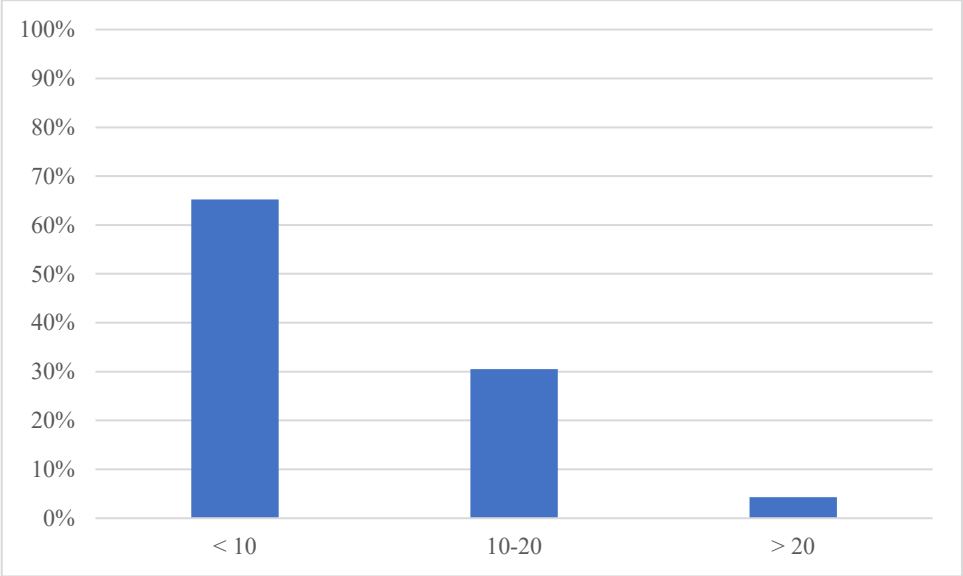

Figure 5-18: Number of types of beer produced by Marche Region craft microbreweries

On one thing, however, the craft microbreweries are in almost total agreement: almost all the beers produced (87%) are high fermentation beers. All the breweries that took part in the survey use barley in the production of their beers, 78,2% use wheat and 56,5% use oats. These are the cereals most used by craft beer producers in the Marche Region. In addition to these, rye is used by more than a fourth of the sample (26,1%) while spelled and corn from a minority, both from 8,7% of microbreweries (Figure 5-19).

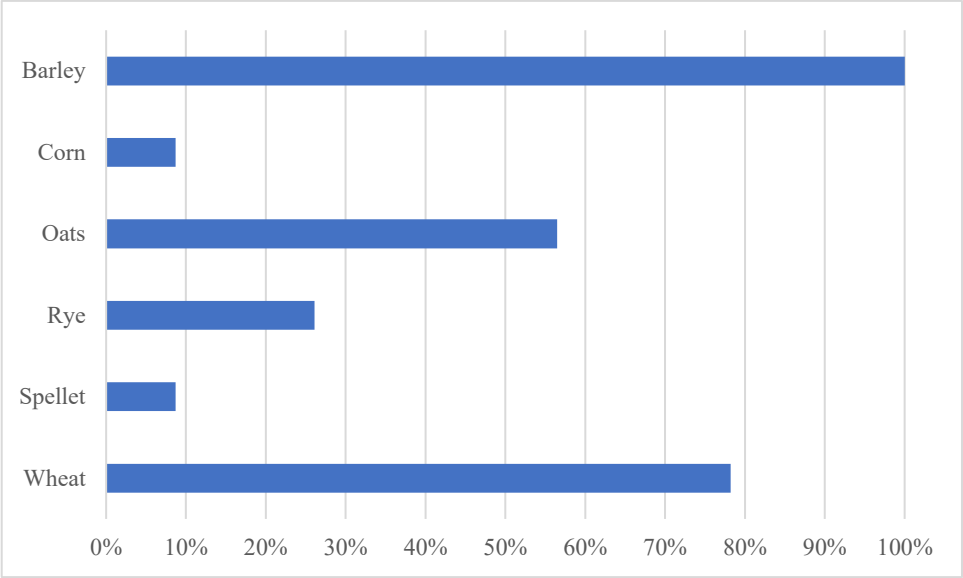

Figure 5-19: Types of cereal used from the sample to produce their beers

Regarding to the origin of the cereals used for the production of craft beer, only 13% of the sample has a totally Italian origin. 43,5% buy their cereals exclusively from abroad and another 43,5% both from Italy and from abroad (Figure 5-20).

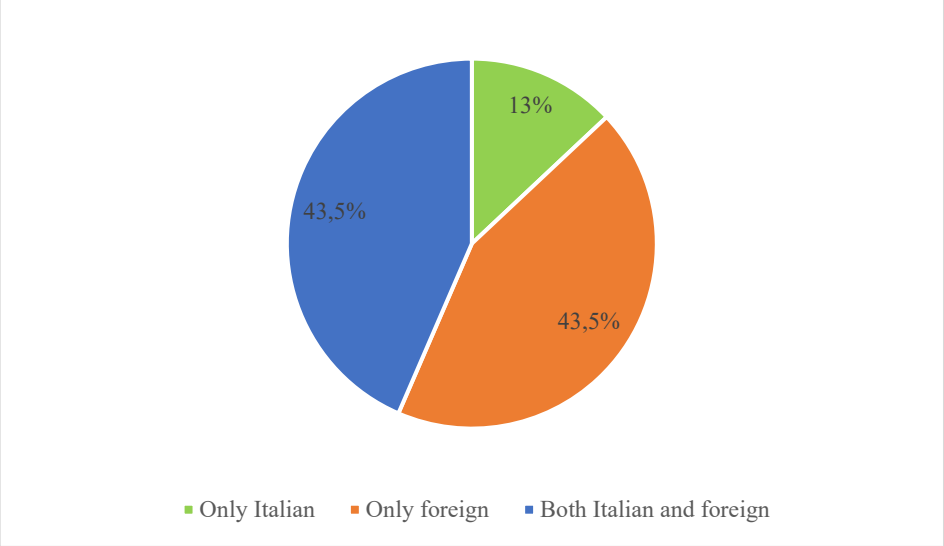

Figure 5-20: Origins of the cereals used for the production of Marche Region craft beers

The foreign countries from which the craft breweries of the Marche Region buy their cereals are resulted to be Germany (90%), United Kingdom (40%), Belgium (35%), the Czech Republic (15%) and Austria (5%) (Figure 5-21).

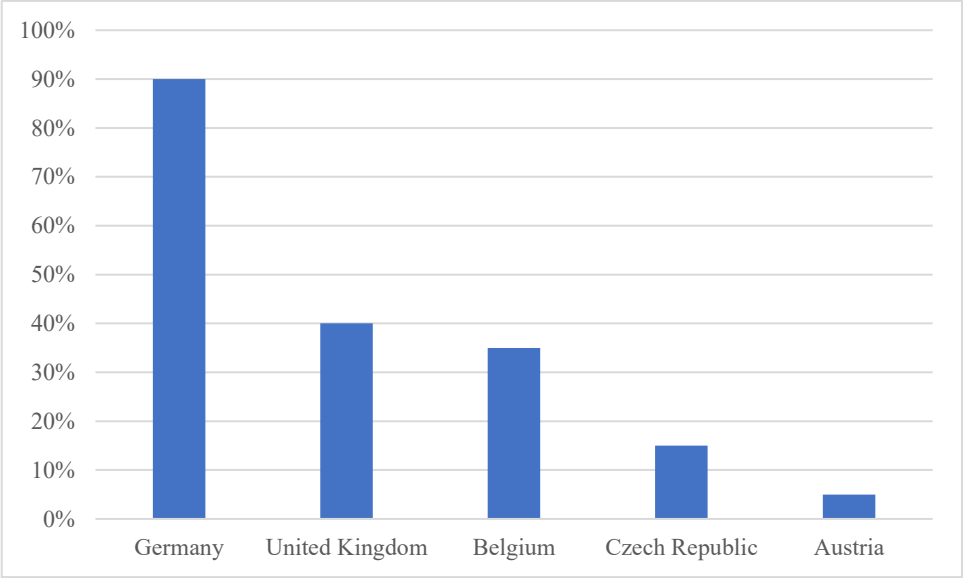

Figure 5-21: Countries from which Marche Region craft microbreweries buy the cereals for the production of their beers

The percentage of foreign cereals that the 43,5% of craft breweries that buy both Italian and foreign cereals use are very variable. The quantities range from very small (3-5%) up to 90%, passing through the 20%, 25%, 40% and 60%. 60% of these breweries use foreign cereals in quantities equal or smaller than 25%. The remaining 40% use foreign cereals in quantities equals or greater than 40% (Figure 5-22).

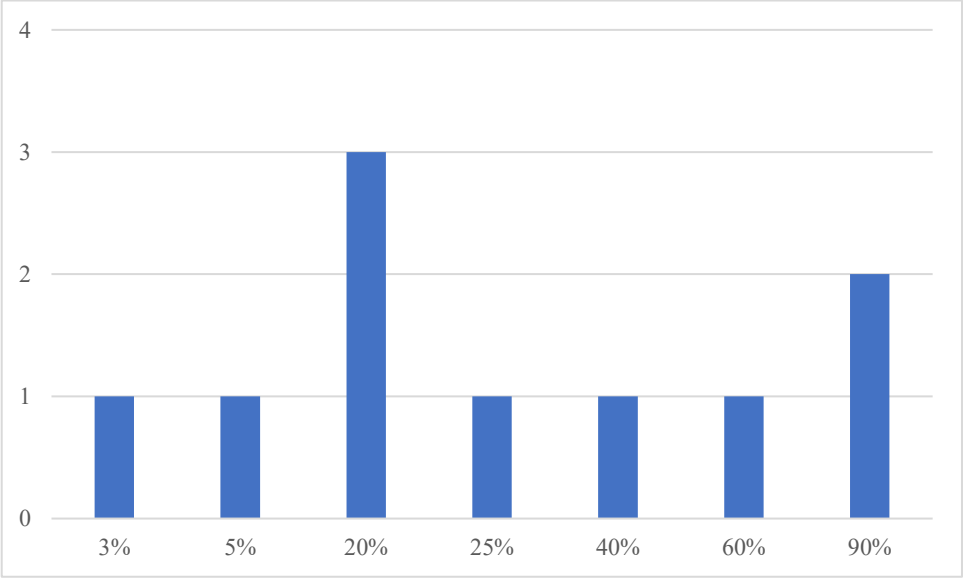

Figure 5-22: Percentage of foreign cereal in beer production from 43,5% of the sample which use both Italian and foreign cereals

The reasons why some breweries buy foreign cereals lies in the fact that according to them they are of higher quality (quality understood in all its aspects) compared to Italian cereals for the production of beer. The price and availability factors of national cereals do the rest. 75% buy foreign cereals for their superior quality, 25% for the most advantageous price and 35% because of the scarce availability of national cereals, including special selections (Figure 5-23).

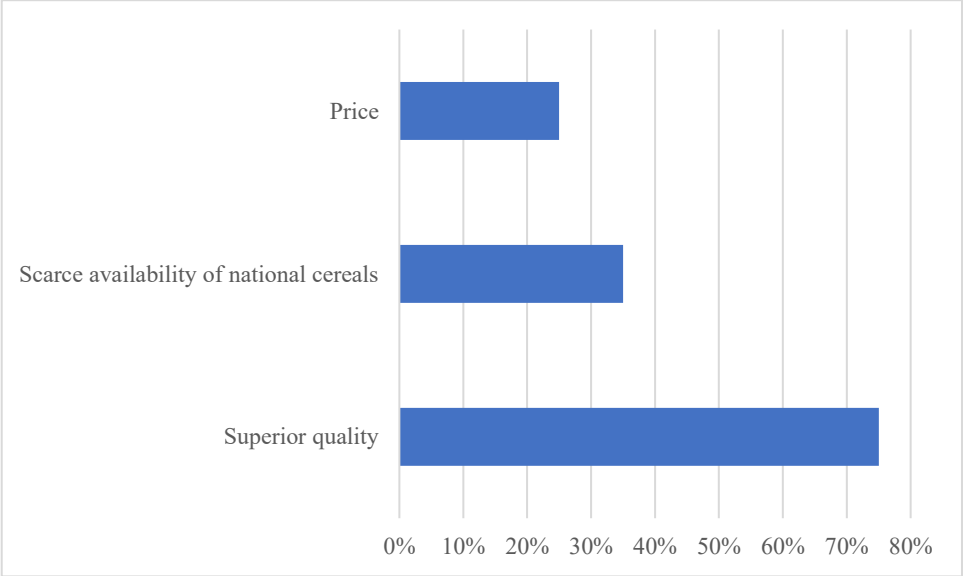

Figure 5-23: Reasons that lead the craft beer producers of the Marche Region to the purchase of foreign cereals

65,2% of the sample use special ingredients for the production of their craft beers. Special ingredients include fruits (pineapple, peach, orange, apple, berries, coconut, pumpkin, bergamot, pomegranate, passion fruit, blueberry, prickly pear, dates) spices (pepper, cardamom, cinnamon, liquorice, anise, cloves, hibiscus, ginger, coriander) but also honey, coffee, chocolate, grape and pecorino cheese must.

Over 95% of the breweries analysed use the keg as one of the main sales formats. Other very common formats are the 33 cl, 50 cl and 75 cl bottles (69,6%, 43,5%, 39,1% respectively). 66 cl (4,3%) and 1l (4,3%) bottles are also used (Figure 5-24).

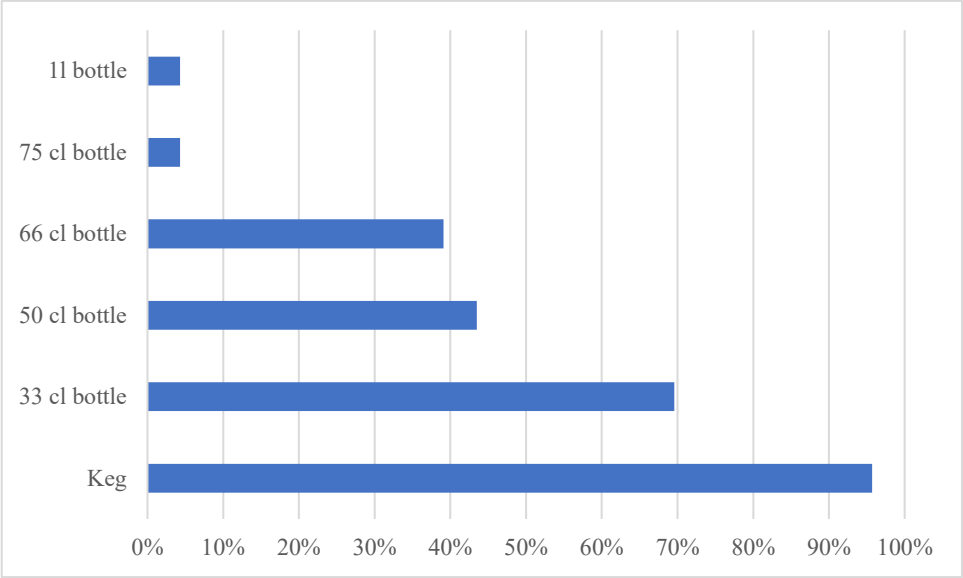

Figure 5-24: Sales formats used by Marche Region craft microbreweries

The main sales channels were found to be bars, pubs, restaurants, pizzerias and direct sales at the brewery respectively for 87% and 69,5% of the sample. Sales at trade fairs, demonstrations and events represent 52,2% of the sample, followed by 34,8% who mainly use specialized shops (beer shops) and 17,4% online sales. Only 4,3% of the sample uses the supermarket and large-scale retail trade as one of the main sales channels (Figure 5-25).

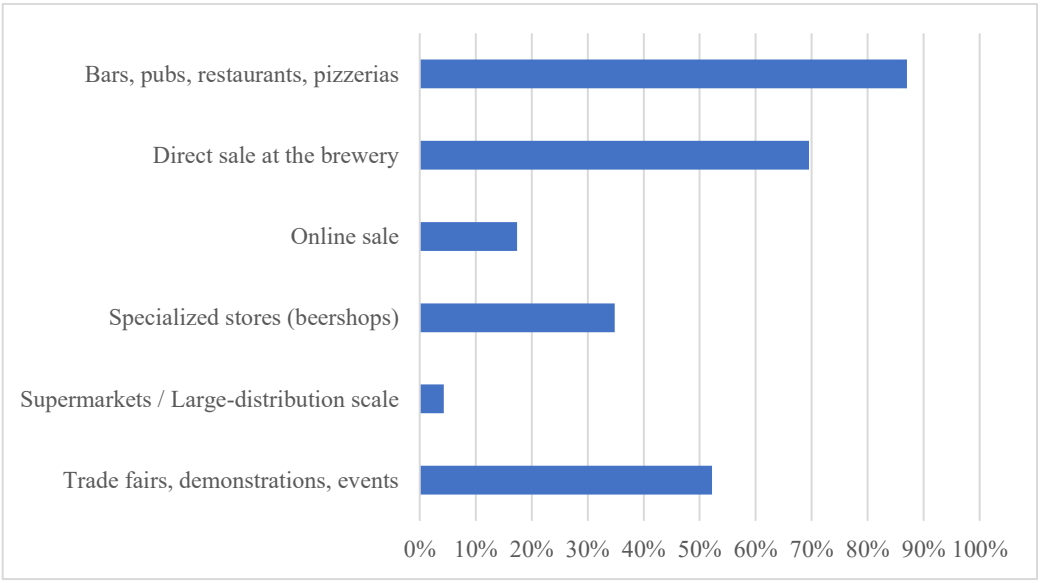

Figure 5-25: Sales channels used by Marche Region craft microbreweries

Most of the microbreweries sell their beers nationwide, but 13% also sell their products abroad. The countries to which the Marche Region craft beers go are France, Belgium, Switzerland, Sweden and Spain, for a total of 5-10% of the total sales of those microbreweries that overcome Italian boundaries with their specialties.

Regarding the advertising of craft beer, 73,9% of the craft breweries that responded to the survey believe that craft beer is poorly advertised. Almost all microbreweries (91,3%) mainly advertise their product via social networks (Facebook, Instagram, Twitter, etc.), 73,8% through fairs and events, 39,1% through events within the brewery, 26,1% through tasting events. 17,4% of the sample advertise their product through their brewery website or blog and another 17,4% through the participation in breweries competitions. 13% of the sample advertises their beer through paid advertising on specialized sites. Only 4,3% sponsor their product through collaboration with other microbreweries, as well as traditional print advertising which seems to be outdated (Figure 5-26).

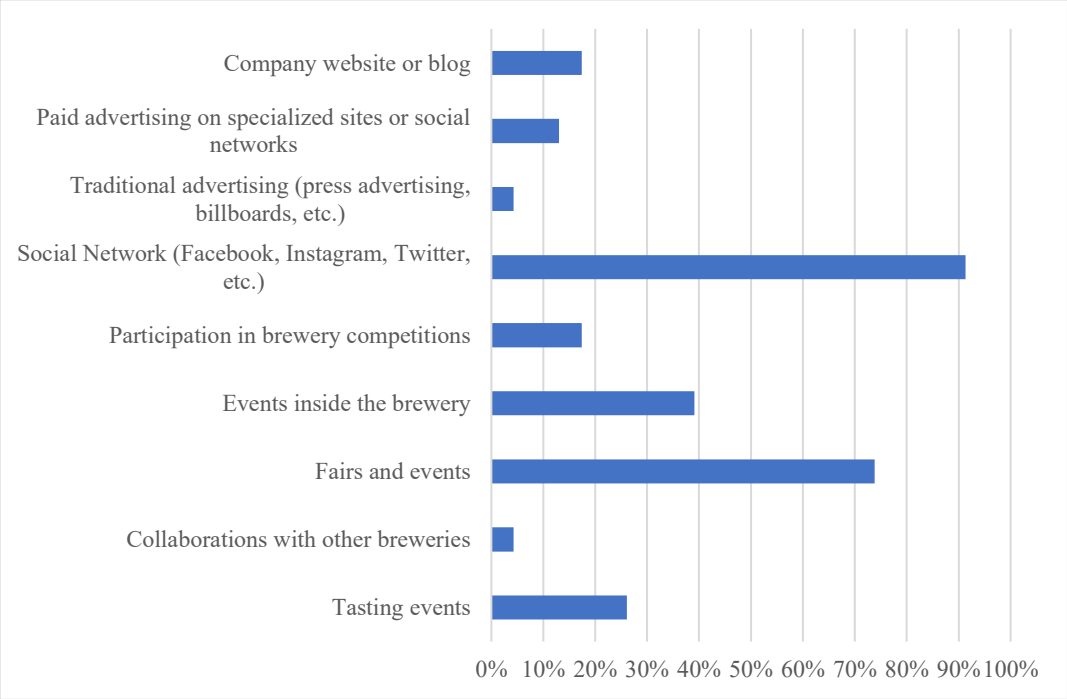

Figure 5-26: Main channels for craft beer advertising used by Marche Region microbreweries

According to 65,2% of the owners of craft breweries, the knowledge of craft beer by consumers is poor, good for the 30,5% and very good for the remaining 4,3% (Figure 5-27).

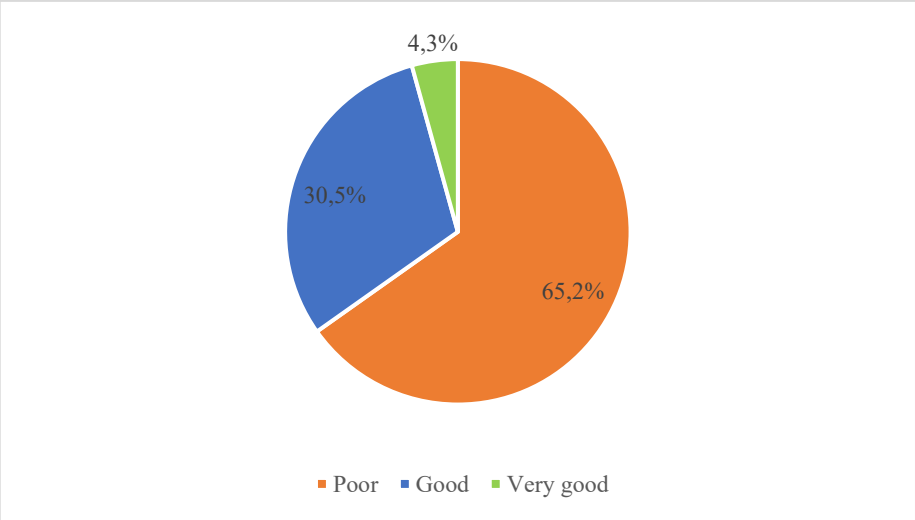

Figure 5-27: Producers' opinion on the consumers' craft beer knowledge

Regarding the factors that the owners of microbreweries consider most important in the production of their beer, the quality of the finished product (91,3%) prevails, followed by originality and refinement (43,5%), promotion and enhancement of the territory (39,1%), naturalness and genuineness (34,8%), packaging (34,8%).Customer loyalty is one of the most important factors for 21,7% of the microbreweries owners, price for the 17,4%, while production quantity only for a 8,7% as well as the use of local/regional/national cereals/malts (Figure 5-28).

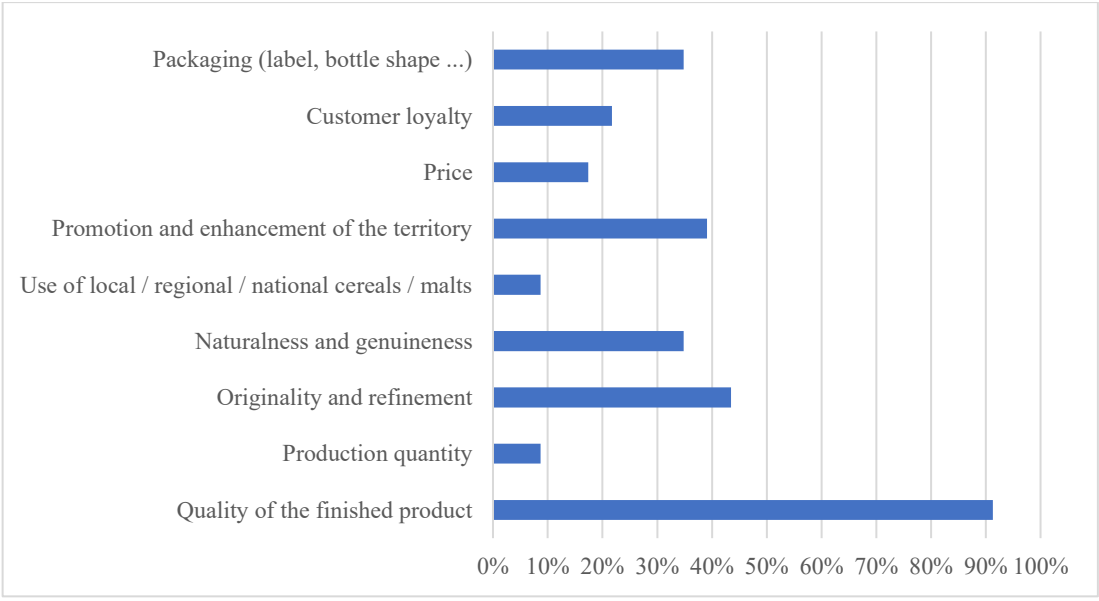

Figure 5-28: Factors that the craft beer producers of the Marche Region consider most important in the production of their product

As anticipated, as well as for consumers, the owners of the microbreweries were asked to weigh each of the factors that have just been listed on a Likert scale from 1 to 5 (where 1 corresponds to not at all important and 5 to very important). In this quantitative analysis, the quality of the finished product is confirmed to be the most important factor for the owners of microbreweries (very important for the 91,3% and important for the 8,7%). The quantity of production, on the other hand, seems to divide the producers quite a lot, as well as the use of local/regional/national cereals/malts and the promotion and enhancement of the territory. For the first of these 3 factors, producers say they are indifferent for 26,1%, they consider it important for 34,8% and unimportant for 30,5%. As for the other two factors, very tied to the territory, the use of local cereals was found to be indifferent for 43,5% of the sample, important for 26,1%, very important only for 8,7%, unimportant for 13% and not at all important for 8,7%. The promotion of the territory seems to leave 30,5% of the producers indifferent, but also to be important for 39,1% and very important for 21,8%. Originality and refinement were found to be important for 60,9% of the sample and very important for 21,8%, but 13% considered it indifferent. 52,2% of the sample consider the naturalness and genuineness of their product very important, 39,1% believe it to be important and 8,7% indifferent. The selling price was found to be important for 60,9% of the sample, very important for 8,7% but also indifferent for 21,8%. Customer loyalty and packaging turned out to be two quite important factors for producers, important for 47,9% and 52,2% respectively, very important for 39,1% and 30,5%, indifferent for 13% of the sample for both factors. Results of the weighting of the factors by microbreweries owners on the Likert scale are summarized in Figure 5-29.

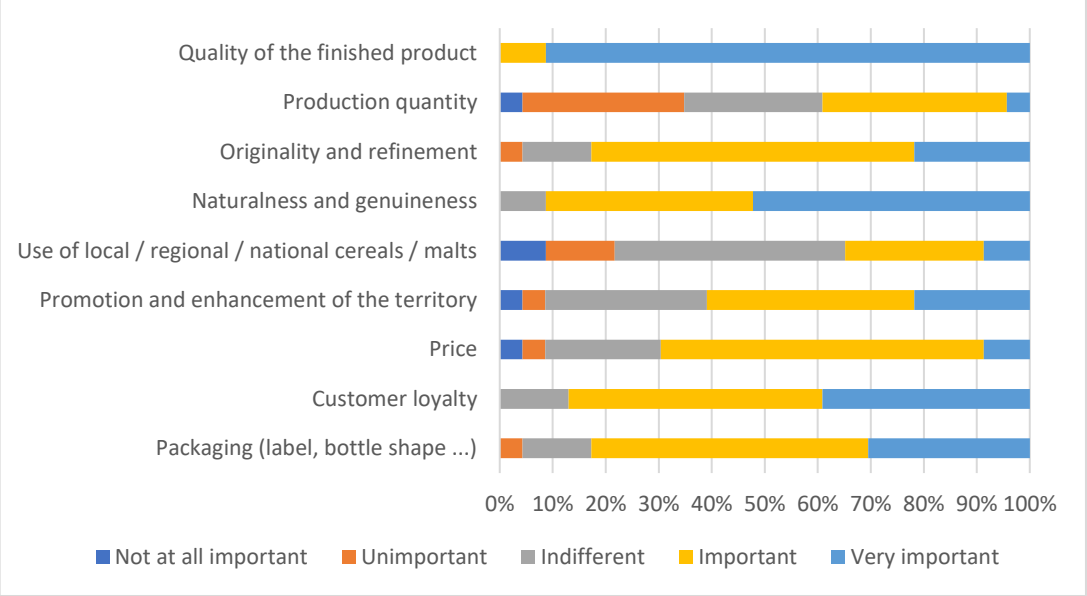

Figure 5-29: Summary of the quantitative analysis addressed to producers

Regarding results about the SWOT analysis, for 65,2% of microbreweries, the quality of their finished product represents an important strength of their company. 21,7% believe the originality and refinement of their finished product to be a strength, an equal fraction of the sample for the experience, seriousness, honesty and respect of the customer, a further 21,7% indicate as strength the presence on the territory and direct sales from the producer to the consumer. 13% of the sample consider their wide range of products offered to be their strength (Figure 5-30).

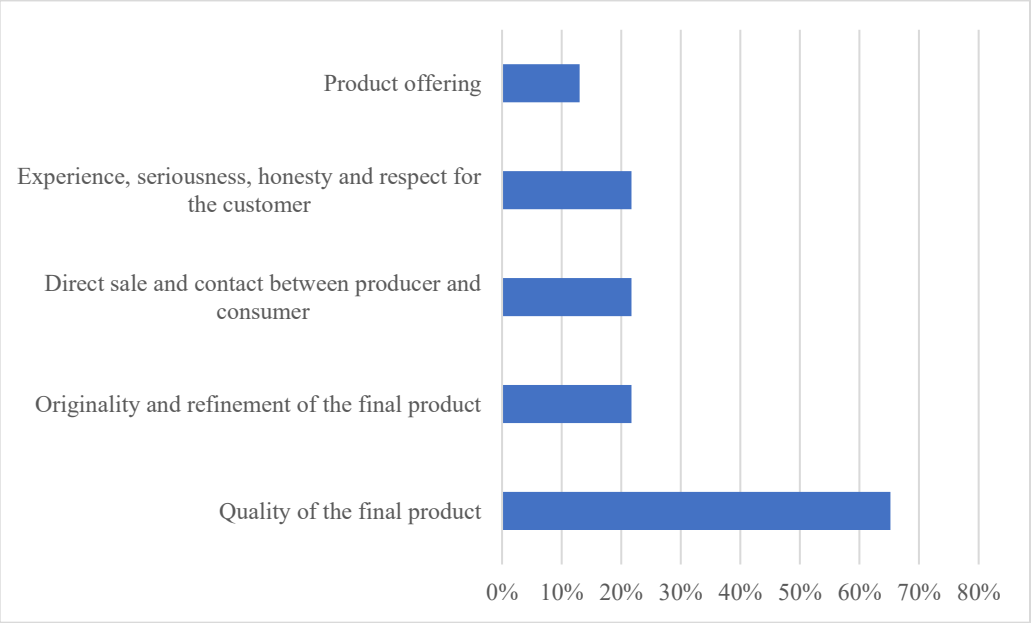

Figure 5-30: Summary of Marche Region microbreweries strengths

Regarding the weaknesses, the situation changes slightly as the microbreweries have indicated 5 main weaknesses that have proven to be quite common among all. 39,1% indicated the logistics and size of their premises, 34,8% the limited production, 30,5% the limited distribution of their product, 26,1% the fact of not being able to contain costs and consequently the price of the finished product, while 21,7% agree on advertising as a microbrewery's weakness (Figure 5-31).

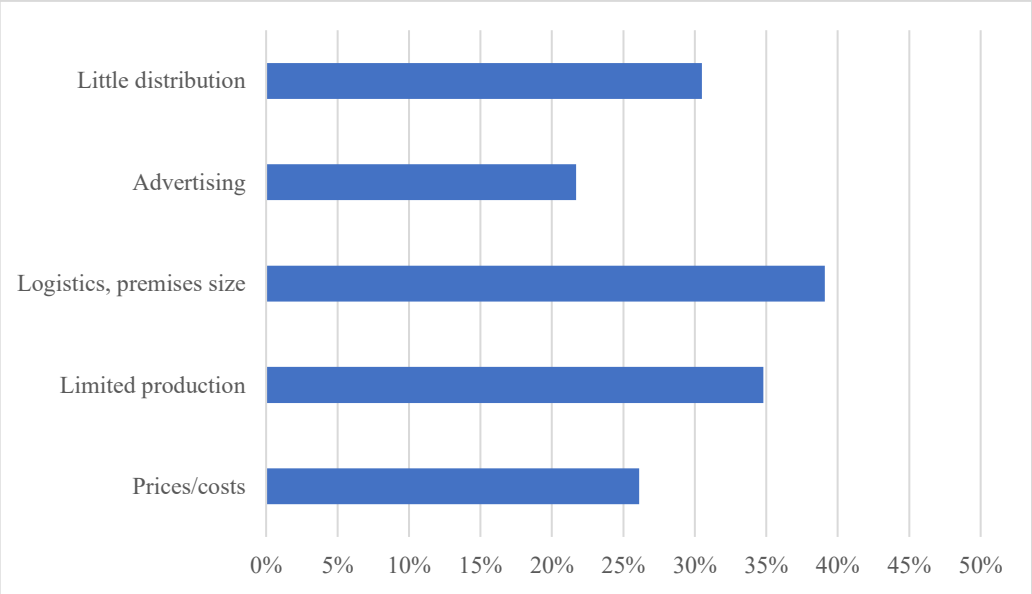

Figure 5-31: Summary of Marche Region microbreweries weaknesses

About the opportunities, 52,2% of the sample indicated the automation and implementation of the premises, 34,8% the increase in production quantities and product distribution, 17,4% identified e-commerce as a potential opportunity that the microbrewery could seize, another 17,4% would like to participate in brewing competitions to better promote their product and 8,7% sees in the regional/national/European funds a good opportunity to make improvements to the company (Figure 5-32).

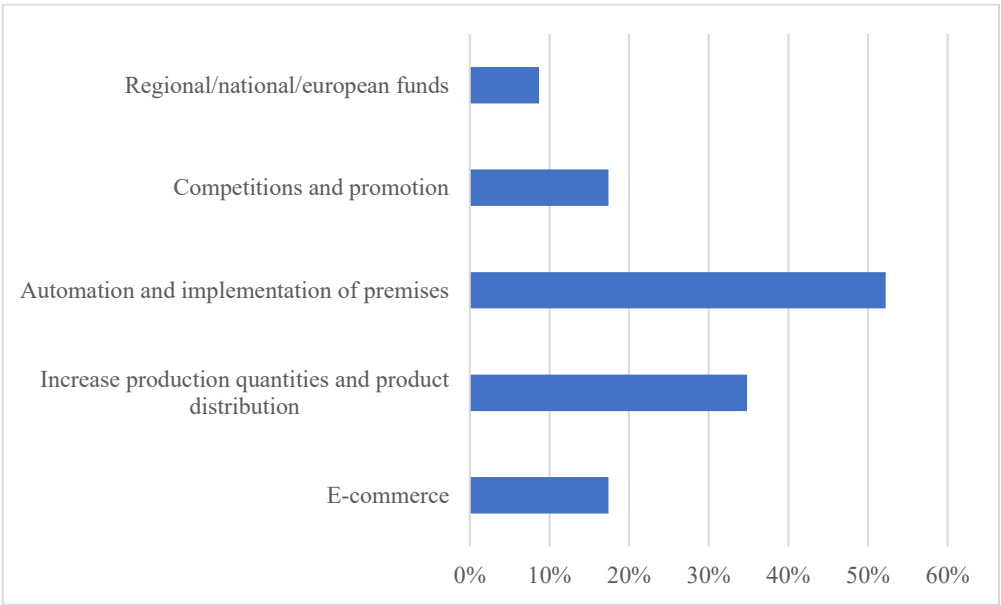

Figure 5-32: Summary of Marche Region microbreweries opportunities

To conclude the results of the SWOT analysis, let's finally analyse what are the threats that the owners of the microbreweries of the Marche Region feel for their company. Almost half of the sample (47,8%) identifies the main shared threat in competition with industrial breweries that entered the national market with craft beer brands, as these brands would increase confusion in the craft beer sector, leaving the consumer interdicted. 43,5% feel the threat of the strong financial crisis that is going through our country right now, in which it was already difficult to maintain prices and limit costs, amplified and increased by the current global pandemic situation of Covid-19. A 30,5% feel threatened by the poor quality of breweries that negatively influence the craft beer consumers (especially the new ones) about the reliability of microbreweries and the quality of the finished product (Figure 5-33).

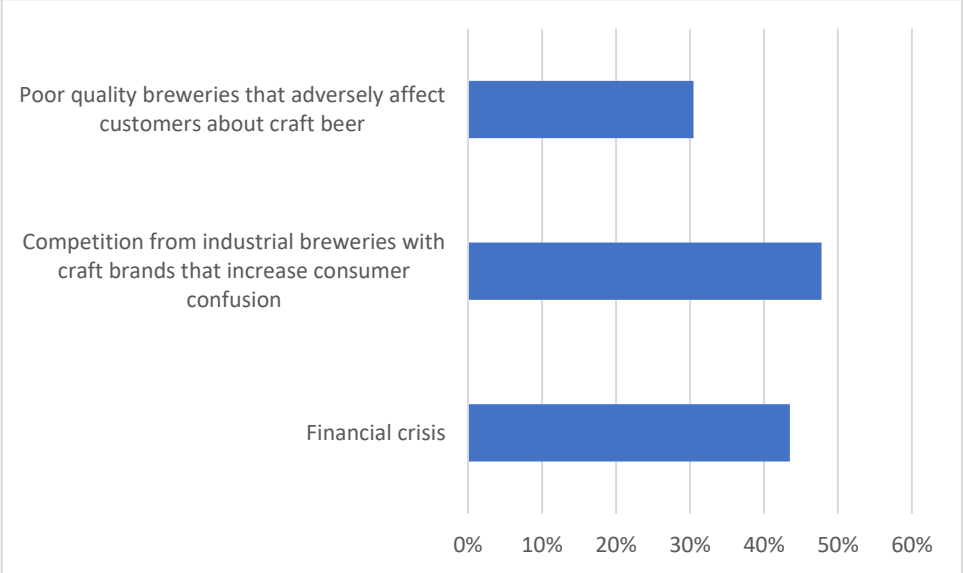

Figure 5-33: Summary of Marche Region microbreweries threats

Regarding future investments that microbreweries owners would be intentioned to do, premises expansion and improvements to equipment and instrumentation seems to be the most common investment, shared by 52,2% of the sample. Other relevant ideas that microbreweries underlined was the e-commerce (17,4%) and advertising (17,4) confirming the fact that 73,9% of the sample believe that craft beer is poorly advertised and 21,7% who believe that advertising is one of the most important weakness of his/her microbrewery. 8,7% of the sample would be intentioned to invest in their training and in the participation in events, another 8,7% would like to spend money to improve the microbrewery sustainability and the sustainability of their product, raw materials production included (Figure 5-34).

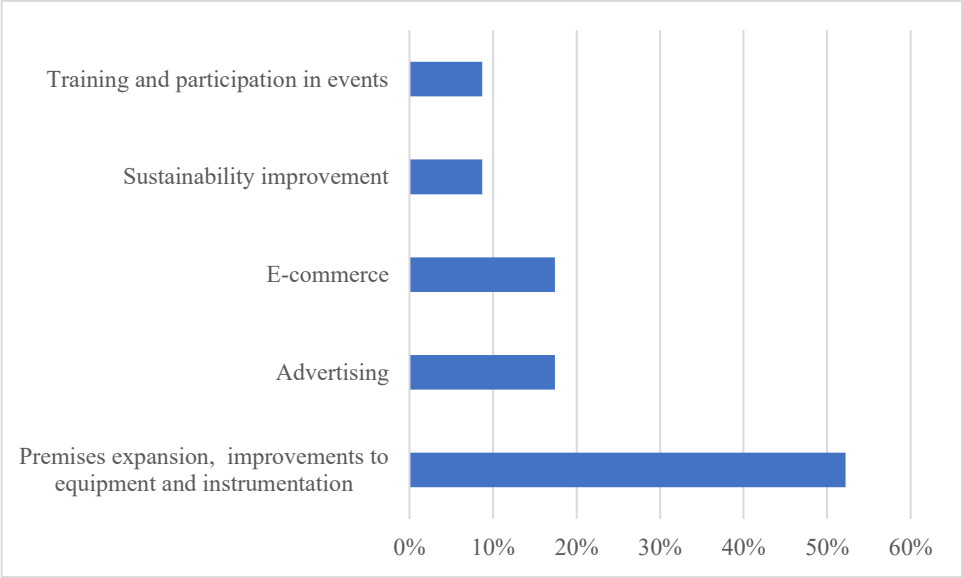

Figure 5-34: Ideas on potential future investments by Marche Region microbreweries

Before going to the final section of the questionnaire, microbreweries owners were asked if they would be interested in becoming an agricultural brewery. 36,8% of the microbrewery that are not already agricultural breweries said to be not interested in. However, more than a half (63,2%) would be interested in becoming an agricultural brewery. Answers about why yes and why not are shown in Table 5-3.

Table 5-3: Pros and cons of the choice to become an agricultural brewery

Pros	Cons
Subsidized taxation	Difficulties in controlling raw materials and their quality
Greater territory valorisation and more territory tied product	Lack of adequate land and important investment required
Greater control over the entire supply chain	More constraints and limited choice of raw materials

Regarding the socio-demographic analysis of the microbreweries owners, 91,3% of the sample resulted to be man, 60,9% with age between 26 and 40, 34,8% between 41 and 60 and only 4,3% of the sample have an age between 18 and 25 (Figure 5-35).

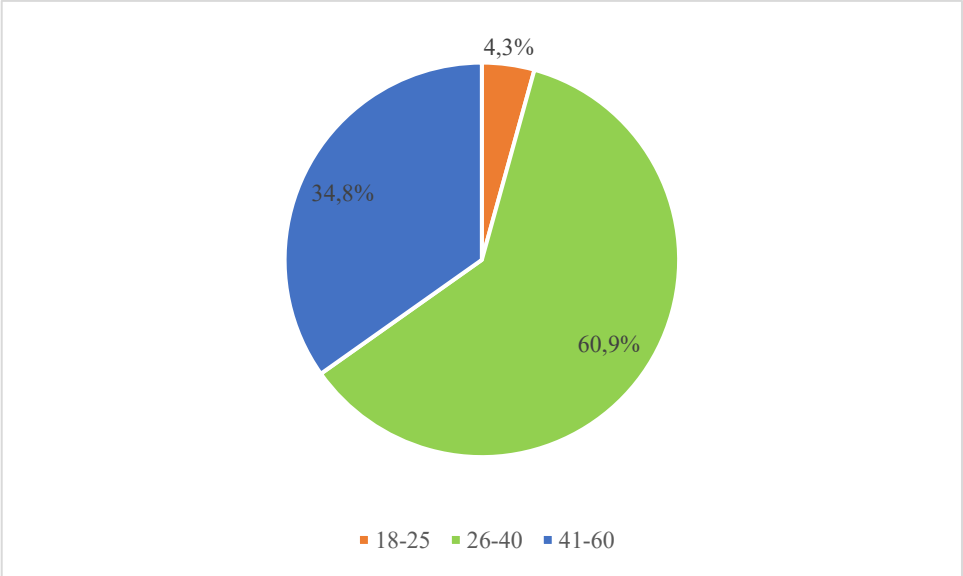

Figure 5-35: Age of microbrewery owners

The sample was found to have a good level of schooling considering that 43,5% have a high school diploma, 30,4% have a degree and 17,4% have completed post-graduate education. Only 8,7% of the sample have a middle school diploma (Figure 5-36).

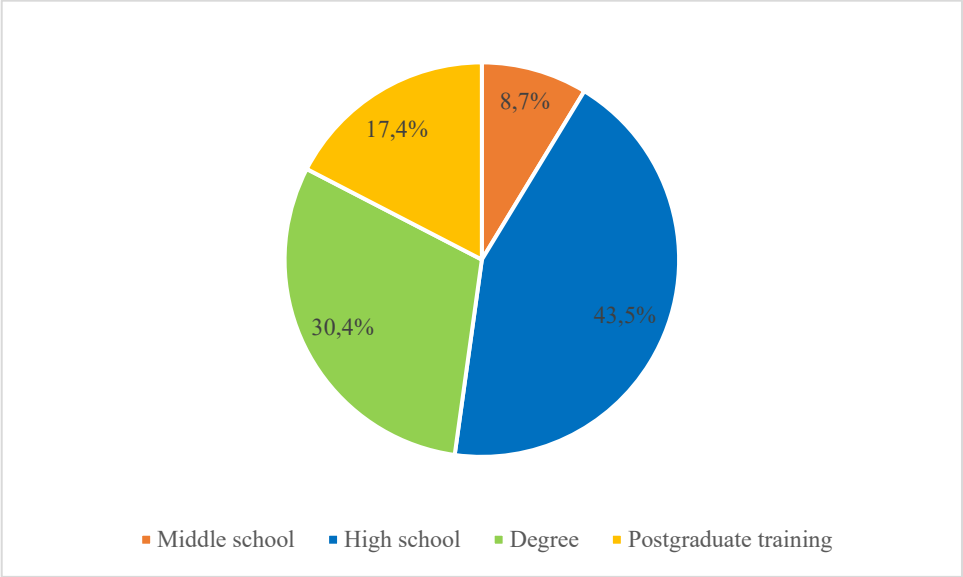

Figure 5-36: Educational level of the sample

Last question for the microbreweries owners was what are the reasons that let them enter to the craft beer world. A big majority says that this idea started with homebrewing activity (65,2%), powered by their passion (60,9%) and stimulated by the business opportunity that it

represented (52,2%). 17,4% entered to the craft beer world through training and qualification courses, 13% through their professional experience gained in the beer sector and 4,3% through tasting courses (Figure 5-37).

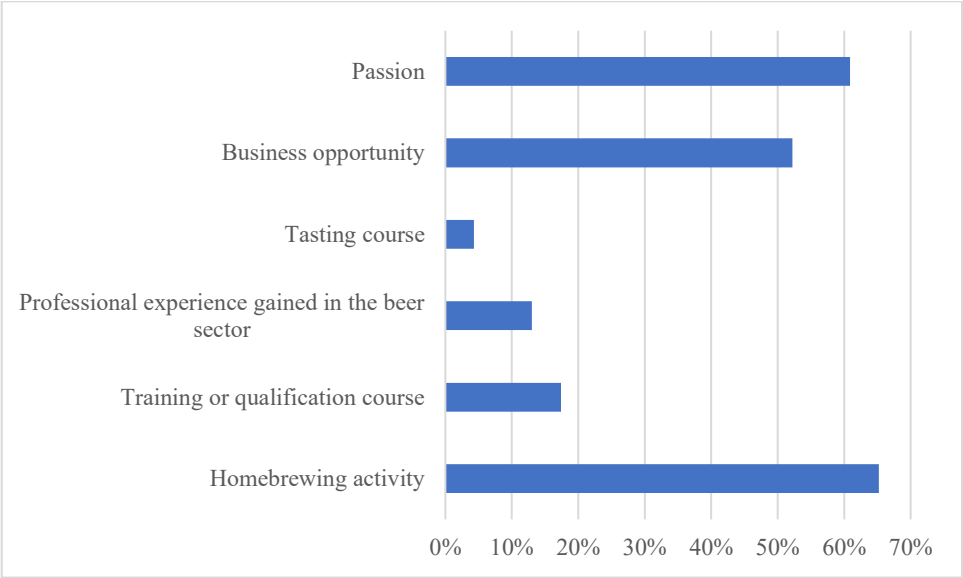

Figure 5-37: Reasons that leaded microbreweries owners to enter the craft beer sector

5.3.3 Consumers profile

From the analysis of socio-demographic data, from the qualitative and quantitative analysis of the sample of people who consume beer, we can outline the typical profile of the craft beer drinker. Our model is indifferently male or female (confirming that the female category is growing, ever closer to the male consumption numbers)(AssoBirra, 2018), under the age of 40 and with a fairly high level of schooling (high school diploma or degree). In fact, consumers of craft beer are mostly students and employees, unmarried and with an annual household income between € 21.000 and € 35.000 (Figure 5-38). The typical consumer has consumed craft beer on average for 3-5 years with the frequency of a few times per month. He/she consumes craft beer mainly outside the home (bars, pubs, beer houses) during the outings.

- < 40 years old
- High level of schooling (high school diploma / degree)
- Student / employee
- Annual household income between € 21.000 and € 35.000
- Unmarried male/female

Figure 5-38: Craft beer consumer profile

He/she considers the richer and less standardized taste compared to industrial beer, the superior quality, the production method, the consistency, the aroma, the originality, the refinement, the naturalness and the genuineness of the product, the support for small producers and the local origin / link with the territory of beer and its raw materials to be decisive in the choice of consuming craft beer (Figure 5-39). The typical consumer is not very interested in the brand's reputation, in line with recent studies that indicate the growing desire to experiment, know and test new flavours and go in search of something new and different from the usual. He/she is also indifferent about the alcoholic strength of beer, going to confirm the studies that indicate craft beer as a drinking experience totally different from that of industrial beer, according to many used for purposes mainly of becoming drunk. The typical consumer remains more or less indifferent also with regards to the sale price, the packaging and the availability of the product in the distribution.

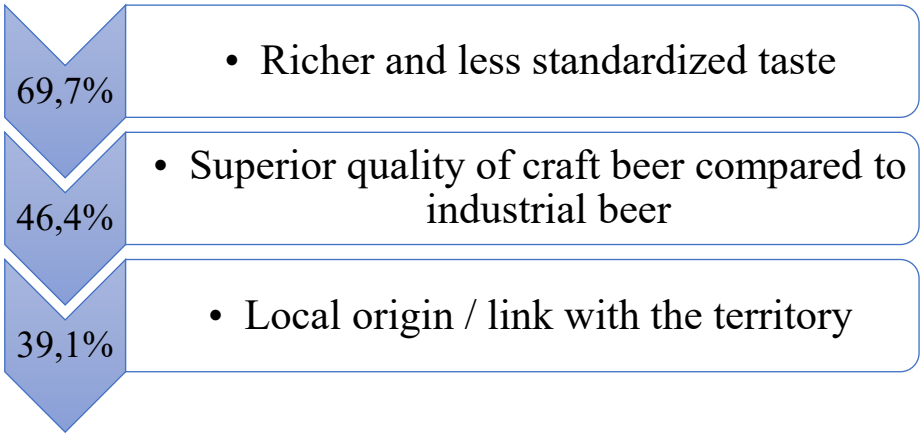

Figure 5-39: Factors affecting consumer's choices

5.3.4 Marche Region craft beer producer profile

From the results of the second questionnaire, it is possible to outline the typical profile of the Marche Region craft microbrewery owner. He is a young man (26-40 years old) with a high school diploma that have entered the world of craft beer mainly for the passion and curiosity arrived from the homebrewing activity. His microbrewery is a craft brewery founded in 2015, based in the province of Ancona, with a number of employees between 1 and 3. He produce less than 100 hl per year and have a turnover class between € 50.000 and € 100.000. His brewery produces less than 10 different type of beers, the majority at high fermentation. He uses indifferently totally foreign cereals or both Italian and foreign cereals for the production of his beer. Foreign cereals are bought from Germany for their superior quality. Special ingredients are also used in the production of the beer, such as fruits, spices and other. The brewed product is sold within national borders mainly at bars, pubs, pizzerias and restaurants in kegs. Regarding advertisement of his product, he mainly uses the most famous social networks and thinks that the craft beer in general is poorly advertised and that craft beer consumers knowledge about the product is poor. He found very important factors on the production of his beer the final quality and the naturalness and genuineness, while consider important the production quantity, the originality and refinement, the packaging, the customer loyalty, the price of his product and the promotion and enhancement of the territory. As confirmed by the origin of the cereals used, he is indifferent regarding the use of local/regional/national cereals for the production of his beer.

He considers a strength the quality of his final product and a weakness the logistic and the size of his premises that limited production quantity and make difficult the supply of raw

material and the reaching for clients. In fact, the typical craft beer producer of the Marche Region sees the expansion of his premises and the improvement of the automation of his plant as the greatest opportunity he could take to improve his business overall. Main threat that the typical producer feel is the competition from industrial breweries which entered the market with craft brands. The threat immediately related is that all this will create is an extra confusion on the consumers opinion about craft beer, remembering that for him, consumers knowledge about this product is poor (Table 5-4).

Table 5-4: Strength, weakness, opportunity and threat of the typical Marche Region craft brewery owner

STRENGTH	**WEAKNESS**
Quality of the final product	Logistic and size of premises
OPPORTUNITY	**THREAT**
Premises expansion and plant automation	Competition from craft brands of industrial breweries

5.4 Discussion

After analysing the results of the two questionnaires and outlining the typical profiles of the Italian craft beer consumer and of the Marche Region craft beer producer, we have now a broad vision of the sector. We can compare the results pointing out the strengths and the weaknesses of the sector, what craft beer consumers desired and what craft beer producers of the Marche Region aspire, underlining contact points, misunderstandings and divergences.

The first consideration that catches the eye is the large portion of the sample that consumes craft beer. Almost 9 out of 10 people who know craft beer, consume it. 63,1% of these said they consumed craft beer on an occasional basis (1-2 times a month) confirming that the data analysed so far regarding the outbreak of the craft sector, for a good part, at least for now is dictated by the curiosity of the new product. According to AssoBirra, in fact, 43% of Italians

show a propensity to experiment with new, unknown beers, with consumption levels reaching 61% in the premises (restaurants, pizzerias, pubs, bars) during meals and 64% at home during the dinner (AssoBirra, 2018). Our sample is in line with these data, as consumers indicated that brand awareness is an aspect that for more than 60% of them is of little or no importance, and it is indifferent to 27,4%; 54,3% of the sample consume craft beer outside the home and 41,3% during meals. From this point of view, it seems that the producers have chosen their sales channels well, considering that 87% of the sample of producers indicated bars, pubs, restaurants and pizzerias as their main sales channel, followed by the direct sale at the brewery. This last channel, widely used by craft beer producers in the Marche Region to sell their product (69,5%), is used by more than a quarter of the national consumer sample (26,2%), confirming the curiosity that has invested the sector and above all the interest in the short chain and in the direct relationship with the producer, aspects highlighted and considered important by both consumers and producers. However, a large part of consumers (26,8%) buy craft beer at the supermarket. By crossing this important fact with the SWOT result regarding the possible threats currently present on the market for craft microbreweries in the Marche Region, we can well understand how the threat of competition with industrial breweries that offer craft labels at large retailers is a present and real threat. As we have already learned, the growing numbers of the craft beer sector owe a lot to industries, which with their lines of craft products more readily available than those of microbreweries, reach the consumer more easily and confuse their ideas on the real higher quality of a craft beer compared to an industrial one. This aggressive policy on the part of the industries contributes, according to the producers, to driving the consumer away from the microbrewery's craft beer, as they could run into the craft labels coming from the industry first, be disappointed by the experience and close the doors to new consumer experiences, labelling craft beer as an expensive beer not so much different from the industrial one available at much more advantageous prices. Probably also because of this, 5,7% of beer consumers have not been able to give a definition, even odd or approximate, of craft beer but has been displaced by the question, unable to give even a simple indication of what this product represents for them. This confusion is well perceived by 65,2% of the craft beer producers of the Marche Region, who think that consumer knowledge about this product is currently scarce.

It is also interesting in this context going to analyse the answer given to the optional question that closes the questionnaire for consumers. To the question "Could you list some brands of craft beers you usually consume?" many consumers responded with beer brands from the industries, which in recent years have alluded to a more traditional production,

advertising their product as if it were something special compared to the company's traditional flagship product, adding the wording "unfiltered" on the label and coupling this statement with attractive design that give an idea of traditionality and naturalness. Among these responses we also find incursions of Belgian beers which, although belonging to industrial brands, are worldwide considered to be of a superior quality. This means that these consumers confuse the craftsmanship of beer with that of the industry, but that they understand craft beer as a high-quality product, not comparable to traditional Italian industrial brands.

Going back to the occasions when consumers consume craft beer, 29,7% said they consume the product on special occasions. This may mean several things. Consumers see craft beer as a superior quality product, which is worth sharing to celebrate important events, for some, perhaps, almost the equivalent of sparkling wine. It is not a coincidence that beer in Italy also begins to be seen in place of this famous drink for celebrative toasts. In fact, on national television, several food programs focus on beer. In a very famous program in Italy, led by one of the major Italian chefs, the winner of his competition is celebrated with beer. Notoriously and traditionally in Italy, toasts of that type are made only and exclusively with sparkling wines. The only bitter note is that the beer in question is Belgian and industrial. We therefore understand how this invention is absolutely for advertising purposes, however it focuses on the fact that our consumers who joined the questionnaire pointed out. Craft beer is also a celebratory drink, for special occasion, precisely. The fact that a traditionalist country like Italy has opened up to this type of exception from the rule (and above all in a context of high quality and traditional level) makes us understand how beer has absolutely entered decisively in our lives. If in the long run beer will truly replace sparkling wine in its celebratory aspect in Italy, this is something we cannot say today; above all because wine, despite having lost part of its consumption quotas in Italy, maintains a solid leadership position on all other alcoholic drinks consumed nationally.

Deepening the analysis of the different potentials of the industry and the craft sector, another important and sometimes decisive factor is advertising. In fact, 73,9% of the owners of the microbreweries that responded to the survey believe that craft beer is poorly advertised, as confirmed by 46,9% of industrial beer consumers who, do not consume craft beer due to poor advertising. Translated: it is a product that they do not see, and perhaps for this reason they do not trust in it. By definition, advertising is a promotional tool to bring the consumer closer to the product, to make them see and know it (Dyer, 2009). Consequently, if a consumer accustomed to being bombarded with novelties does not see craft beer among these, he will probably never learn about it or trust too much of the product that will always remain unknown

and distant from him. As said the producers perceive this lack and this gap with respect to the industrial world, so much so as to indicate among the main weaknesses of their activity precisely the lack or insufficiency of the advertising they are able to do (21,7%), as well as among the main opportunities (17,4%) and among the fields of intervention in which they would be inclined to make hypothetical future investments (17,4%), precisely the promotion and advertising of their microbrewery / product. The lack of adequate advertising by craft breweries highlighted in Chapter IV and confirmed by surveys, is mainly due to the lack of funds to be dedicated exclusively to this field. As we have seen from the analysis of the results on the socio-demographic data of the breweries, they are small (56,5% have a number of employees from 1 to 3 and 30,5% of the microbreweries have no employees) and consequently have a limited budget that derives from limited revenues (more than half of the sample has incomes of less than € 100.000 per year), nothing to do with the turnover numbers of industrial breweries such as "Birra Peroni" owned by the Heineken group which currently has a turnover of € 423 million (Manuelli, 2020).

The small size and the low earnings were due to the local and craft character of the microbreweries in question, but also and perhaps above all from the fact that they recently started their business. In fact, 65,3% of the microbreweries sample has opened their doors since 2015, with a real regional boom that has followed the national trend already shown in Figure 4-4 in the years 2015 and 2016 (30,5% of the sample opened in 2015 and 26,1% in 2016). Given the awareness of craft producers about this sore point and given the intention to invest in this sector, it cannot be excluded that in the coming years we will see a growing presence of advertising of craft beer from microbreweries. Currently, producers prefer to sponsor their business and products through the social channels of the company, presumably because of the low cost they have to sustain for this promotion method. In the face of limited visibility confirmed by the large part of craft beer consumers (44%) who declare that they have never seen craft beer advertising, a good part (45%) said that they saw the advertising of craft beer mainly on social networks, confirming the good opportunity that this sponsorship channel can offer for low costs and immediacy, always taking in mind that it is not enough to achieve a good level of promotion.

Noteworthy is the fact that only 4,3% of the owners of craft breweries in the Marche Region said they collaborated with other breweries in the area to increase their visibility. This aspect is clearly overlooked by these craft breweries, but given the current scarce availability of the same to invest on advertising channels, this could instead be a very interesting and low-cost solution. The organization of joint events with other breweries could increase the possibility

of being seen and noticed in their own territory, thus increasing the human relationship with the customer, increasing their trust in local businesses that would appear so cohesive and willing to make the territory itself and the people who live in it one of their strengths, without necessarily having to be in bitter competition. The collaboration could help everyone, the consumer and the producers who could advertise themselves locally at costs shared with other breweries. In this way, consumers would probably feel even more part of a movement and would be interested in becoming more part of it, in forming a group, seeing that producers are also united in a single purpose: make grow the craft world, enhance the territory of belonging and bring the consumer closer to the product.

The characteristic of being small, perhaps sometimes too small as regards the premises available for production and, in the case of brewpubs, the premises available for serving beer, is seen as a weakness by the owners of the craft breweries of the Marche Region that could do much more by expanding their spaces. Not surprisingly, the main opportunity that the same owners see for their companies is precisely to enlarge their premises and increase the automation of the production process by replacing plants and instruments improving their efficiency. These aspirations are synonymous of a healthy sector, a sector that wants to grow and that has everything it needs to grow. It goes without saying that if the microbreweries in the Marche Region had been in a difficult situation, they would have had other future objectives and aspirations. The fact that the brewers want to increase their production quantities and expand their premises means that they are currently able to satisfy their customers' requests abundantly and that, if they had more product available, they would probably be able to sell it.

To be evaluated, however, there is the effect of the profound financial crisis that is going through our country. Italy was recovering, albeit slow compared to the rest of Europe, after the financial crisis that started in 2008, but like a lightning bolt it fall again in a deep state of emergency in 2020 due to the Covid-19 pandemic which forced the companies to an inevitable stop, starting a global recession which according to the IMF (International Monetary Fund) will affect for a -3% the current year, with a rebound of 5,8% on 2021. This wound that will leave Covid-19 pandemic on the global economy will record a -9,1% for Italy that is in fact one of the most affected countries (IMF, 2020). To date, we cannot say how much this crisis will affect the future of the region's craft microbreweries and how strong this impact will be on the consumption of craft beer which, as we have seen, is not a product for all budgets. It is probable that the crisis will be felt on both sides, on that of consumers who will have less

purchasing power on a product that is in any case expensive and not essential; consequently, it will also affect companies that will have more difficulty selling their products.

From the results of the major threats that the owners of microbreweries perceive for their business, there is in fact a 43,5% of the sample who is frightened by the financial crisis in a sector that as already manifested by them has high costs, which the same find hard to contain. From the greater strength that 65,2% of the brewers agree - the quality of the finished product - in fact derive important investments in the quality and refinement of raw materials (an aspect considered among the most important by 43,5% of producers).

Raw materials: they are the focal point of the next analysis.

As already widely pointed out, in Italy there is unfortunately a major flaw in this important sector: the production of quality raw materials to support the production of beer. In fact, only 13% of the sample of producers use 100% Italian cereals in the production of their beer. The remaining 87% is equally divided between 100% foreign and a mix of both Italian and foreign cereals. The quantity of cereals that the portion of the sample that uses both Italian and foreign cereals buys outside national borders is highly variable. Some use foreign cereals in abundant quantities (from 20% to 90%), while others only in very small quantities (3%-5%). The reasons why these producers go abroad are clear: superior quality compared to national cereals, low availability of national cereals and more advantageous prices of foreign cereals. These aspects are worrying for a sector in continuous and constant growth such as that of craft beer which however needs to be supported by agriculture for the production of high-level raw materials, constant in quality and quantities available, at a reasonable price.

Craft beer consumers consider the local origin of the product and the link with the territory one of the main factors that determine its purchase, so much so that more than 70% of consumers indicate the production of beers with local / regional / national malts and the origin and the link with the territory that the product has, to be important or very important from them. On the other hand, producers believe that these factors are not among the most important in the production of their beer at the same level of the quality of the finished product and its originality and refinement. Only 34,8% believe that the use of cereals of local origin is important or very important, while for 43,5% of the craft microbreweries in the Marche Region, this aspect of production leaves them indifferent. Even 21,7% believe this factor to be little or not important at all. Regarding this issue, the world of consumption and that of production are far apart in their ideas and expectations. Let’s try to understand why.

As confirmed by several studies, the consumer sees a craft product as a product linked to the territory, local, a “home” product (Braun and Dishman, 2006; Fastigi *et al.*, 2015). This

leads the consumer to think of a product close to him in all its aspects, starting from raw materials. The producers, as we have seen, however, do not think in the same way. Probably, this divergence of thought is dictated by the fact that the producers are those "with their hands in the dough", those who really manage to quantify the difficulties (of availability and price) in finding high quality and constantly available local raw materials. The main problem is therefore the one highlighted in the previous chapters: there is no real agricultural system supporting the Italian craft brewing activity. This lack probably discourages producers who already have to face various problems, above all the economic crisis, the containment of costs and consequently the prices and logistical difficulties (many historic centres where the breweries of the Marche Region are located are small and with narrow streets which make difficult the supply of raw materials). This also affects the fact that agricultural breweries are still a minority, despite the fact that, according to Unionbirrai, the Marche Region together with Tuscany and Abruzzo are in a position above the national average. 36,8% of the sample we analysed said they were not interested in becoming an agricultural brewery and expressed their uncertainties regarding the supply of quality local raw materials, as well as having to make important investments that at this time of economic uncertainty it is really difficult to plan. 63,2% of the sample who said they were interested in being able to become an agricultural brewery, are mainly attracted by the greater enhancement that the agricultural product gives to a territory but also, and perhaps above all, to the tax breaks that an enterprise of this type can benefit.

Remaining on the subject of raw materials, barley is used by 100% of the sample of microbreweries, with a good part (78,2%) also using wheat. This choice seems to be appreciated by consumers, as almost a fifth of the sample has declared that they prefer craft beer to industrial beer because of the different and more pronounced consistency (body of the beer). In fact, wheat gives body to beer thanks to insoluble substances which together with yeasts create a cloudy beer with a more pronounced body such as *Hefeweizen* (Bamforth, 2008).

Analysing the sales channels most used by artisanal microbreweries and the purchase channels most used by consumers, it is clear how e-commerce could represent a good opportunity for the immediate future. To date, it remains a channel still underused especially by consumers (only 1,5% of the consumer sample use this method) which, probably due to the lack of confidence in products they do not know or the curiosity that drives them to go and buy the product directly in the brewery to build a relationship of trust with the brewer, prefer other channels. The breweries on the other hand said that they use the online sales method for

17,4% and that they see it as an opportunity for their business, considering also that 17,4% of the sample of microbreweries expressed an interest in investing on this field in the future. E-commerce is slowly catching on also in the field of craft beer which, if it were able to increase the visibility and withstand the competition of the well-equipped craft breweries of the industry, could find in this channel a nice resource.

CONCLUSIONS

At the end of this study we can say with happiness and satisfaction that we have achieved all the objectives we had set ourselves. We managed to outline the two typical profiles of the craft beer consumer and that of the craft beer producer of the Marche Region, we managed to understand how the sector is communicating internally and what could improve it. Fundamental to our analysis were the use of the Likert scale method and the Swot analysis that allowed us to quantify and differentiate by importance the various attributes that were proposed to the interviewees, as well as to analyse the sector in a complete way on the part of the craft beer producers. The various factors proposed (15 to consumers, 9 to producers) were chosen following guidelines dictated by previous studies aimed at analysing the same sector and the same product in question, in order to describe beer with established attributes and in order to be able to compare the data of this analysis with the results of other investigative studies already present.

One of the most difficult challenges we faced were those of obtaining a sample that is as homogeneous as possible under the socio-demographic aspects, especially for consumers, in order to analyse a sample that is as representative as possible of the Italian population. However, the greatest difficulty was certainly that of finding data regarding the craft beer sector, especially in terms of consumption. It should be remembered that this sector is relatively new (officially born in 2016) and in continuous and progressive evolution, but it must also be said that today there are no entities specialized in the creation of databases with data representative of the entire craft beer sector in Italy. The main difficulties probably concern the fact that these brewing companies are small in size but many in numbers, scattered throughout the national territory, and that they are reluctant to disclose their data to entities that today are mostly producer organizations or similar. It is evident that this lack creates a difficulty in a continuously and homogeneously monitoring of the sector, making it more difficult for producers to analyse how the sector is really moving and consequently making it difficult to implement strategies aimed at improving sales and getting closer to the characteristics of product most appreciated by consumers.

Studies like this could help manufacturers better understand consumers' attitudes regarding their preferences in terms of purchasing and product characteristics, making possible better and reasoned planning of the companies' future choices aimed at improving their position in the market.

In the end, we understood how in the face of excellent results in terms of numbers in the beer sector in general and in the craft beer sector in particular, the problems are there and must be addressed to allow the craft sector to consolidate and continue its growth. Production of quality raw materials to support production and culture and knowledge of the product above all. Novelty brings curiosity, but it must be supported by tools (at all levels) capable of making novelty a consolidated product, and curiosity a real culture. Craft beer is a new product in our country that has entered our lives overwhelmingly. The starting point is excellent, it is now up to the sector and the involved parties to know how to evolve and consolidate, without having to remain "an excellent alternative".

REFERENCES

Aquilani, B., Laureti, T., Poponi, S. & Secondi, L., 2015. Beer choice and consumption determinants when craft beers are tested: An exploratory study of consumer preferences. *Food Quality and Preference2*, 41, pp. 214–224.

AssoBirra, 2016. *Assobirra Annual report*. Roma. [Online] Available at: https://www.assobirra.it/annual-report-2016/

AssoBirra, 2017. *Birra Italiana. Guida export 2017*. [Online] Available at: https://www.assobirra.it/wp-content/uploads/2017/06/Guida_Export_Birra_2017_web.pdf

AssoBirra, 2018. *Assobirra Annual report*. Roma. [Online] Available at: https://www.assobirra.it/wp-content/uploads/2019/05/AnnualReport_2018_PagineSingole.pdf

Baladin brewery, 2020. *Baladin brewery website*. [Online] Available at: https://www.baladin.it/en/.

Bamforth, C., 2008. *Grape vs. Grain*. New York: Cambridge University Press.

Billia, M., Bottero, L. & Dabove, L., 2009. *Manuale della birra*. I Edition. Edited by F. Busti. Verona: Gribaudo S.r.l.

Braun, J. & Dishman, B. H., 2006. Microbrewing. In Priest, F. G. and Stewart, G. G. (eds) *Handbook of Brewing*. II Edition. United States of America: CRC Press, pp. 771–816.

Briggs, D. E., Boulton, C. A., Brookes, P. A. & Stevens, R., 2004. *Brewing: Science and Practice*. Cambridge: Woodhead Publishing Limited.

Buiatti, S., 2004. Birra. In Cabras, P. & Martelli, A. (eds) *Chimica degli alimenti. Nutrienti; alimenti di origine vegetale; alimenti di origine animale; integratori alimentari; bevande; sostanze indesiderabili.* Padova: Piccin Nuova Libreria.

Callegari, C. & Zamperetti, S., 2012. *La storia della birra dalle origini ai giorni nostri*.

Carbone, A. & Quici, L., 2020. Craft beer mon amour: an exploration of Italian craft

consumers. *British Food Journal*, 122(8), pp. 2671-2687.

Cardello, A. V., Pineau, B., Paisley, A. G., Roigard, C. M., Chheang, S. L., Guo, L. F., Hedderley, D. I. & Jaeger, S. R., 2016. Cognitive and emotional differentiators for beer: An exploratory study focusing on "uniqueness". *Food Quality and Preference*, 54, pp. 23–38.

COBI, 2020. *COBI website*. [Online] Available at: http://www.cobibirragricola.it/.

Costato, L., 2008. *Corso di diritto agrario italiano e comunitario*. III Edition. Edited by L. Russo. Giuffrè Publisher.

Dal Maso, A. & Bianco, M., 2014. *I birrifici artigianali: la nicchia che diventa la nuova realtà del mondo birraio*.

Decree 4th June 2019, 2019. Italy: Official Gazette of the Italian Republic. [Online] Available at: https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2019-06-14&atto.codiceRedazionale=19A03733&elenco30giorni=true.

Delayen, C., 2007. The Common Agricultural Policy: A Brief Introduction. Washington, D.C.: Institute for Agriculture and Trade Policy.

Dyer, G., 2009. *Advertising as Communication*. II Edition. Routledge - Taylor & Francis Group.

European Commission, 2003. European Commission press release. Bruxelles: European Commission. [Online] Available at: https://ec.europa.eu/commission/presscorner/detail/it/IP_03_1314.

Eurostat, 2019a. *Eurostat*. [Online] Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20190802-1.

Eurostat, 2019b. *Eurostat*. [Online] Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190906-1.

Fastigi, M., Esposti, R. & Viganò, E., 2015. The craft beer revolution in Italy and the agricultural craft breweries: evolutionary trajectories and main critical issues.

Fermento Birra website, 2010. *Fermento Birra*. [Online] Available at: https://www.fermentobirra.com/aprire-un-brew-pub-o-un-microbirrificio/

Garavaglia, C. & Swinnen, J., 2017. The Craft Beer Revolution: An International Perspective. *Choices Magazine of Agricultural & Applied Economics Association (AAEA)*.

Gomez-Corona, C., Escalona-Buendia, H. B., Garcia, M., Chollet, S. & Valentin, D., 2015. Craft vs. industrial: Habits, attitudes and motivations towards beer consumption in Mexico. *Appetite*, 96, pp. 358–367.

Gresser, A., 2010. *Il manuale del birraio pratico: teoria e pratica della preparazione del malto e della fabbricazione della birra.* Edited by C. Fachverlag Hans. Norimberga.

Idriss, K., Agnolucci, M., Raffa, F. & Giovannetti, M., 2015. *Monitoraggio e caratterizzazione microbica di alteranti della birra in una potenziale fase critica del processo di produzione quale la filtrazione*.

IMF, 2020. Exceptional Times, Exceptional Action: Opening Remarks for Spring Meetings Press Conference. International Monetary Fund. [Online] Available at: https://www.imf.org/en/News/Articles/2020/04/15/pr20162-exceptional-times-exceptional-action-opening-remarks-for-spring-meetings-press-conference.

Istat , 2019. Le spese per i consumi delle famiglie. *Istat Report*. [Online] Available at: https://www.istat.it/it/files/2019/06/Spese-delle-famiglie-Anno-2018_rev.pdf

Joshi, A., Kale, S., Chandel, S. & Pal, D. K., 2015. Likert Scale: Explored and Explained. *Current Journal of Applied Science and Technology*, pp. 396–403.

Law n. 1354, 1962. Italy: Official Gazette of the Italian Republic. [Online] Available at: https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=1962-09-17&atto.codiceRedazionale=062U1354&elenco30giorni=false.

Law n. 154, 2016. Italy: Official Gazette of the Italian Republic. [Online] Available at: https://www.gazzettaufficiale.it/eli/id/2016/08/10/16G00169/sg.

LD n. 109, 1992. Italy: Official Gazette of the Italian Republic. [Online] Available at: https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.da

taPubblicazioneGazzetta=1992-02-17&atto.codiceRedazionale=092G0146

LD n. 504, 1995. Italy: Official Gazette of the Italian Republic. [Online] Available at: https://www.gazzettaufficiale.it/atto/serie_generale/caricaArticoloDefault/originario?atto.dataPubblicazioneGazzetta=2010-03-31&atto.codiceRedazionale=010G0072&atto.tipoProvvedimento=DECRETO LEGISLATIVO.

Leiper, K. A. & Miedl, M., 2006. Brewhouse Technology. In Stewart, G. G. and Priest, F. G. (eds) *Handbook of Brewing*. II Edition. United States of America: CRC Press.

Lerro, M., Marotta, G., & Nazzaro, C., 2020. Measuring consumers' preferences for craft beer attributes through Best-Worst Scaling. *Agricultural and Food Economics*, 8(1), pp. 1-13.

Manuelli, M. T., 2020. Peroni, alla guida torna un italiano dopo 15 anni: «Investiremo 70 milioni di euro». *Il sole 24 ore*. [Online] Available at: https://www.ilsole24ore.com/art/peroni-l-ad-italiano-15-anniinvestiremo-70-milioni-euro-ACithaGB.

Marradi, A. & Macrì, E., 2012. Sono equidistanti le categorie di una scala Likert? Alcune risultanze di ricerca, *Firenze University Press (FUP) Journal*, 3, pp. 171–188.

Massot, A., 2020. *First pillar of the CAP: I — Common organisation of the markets (CMO) in agricultural products*, *European Parliament portal*. [Online] Available at: https://www.europarl.europa.eu/factsheets/en/sheet/108/first-pillar-of-the-cap-i-common-organisation-of-the-markets-cmo-in-agricultural

McGowan, R., 1997. *Government Regulation of the Alcohol Industry: The Search for Revenue and the common good*. Quorum Books.

MD n. 325, 1996. Italy: Official Gazette of the Italian Republic. [Online] Available at: https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=1996-06-21&atto.codiceRedazionale=096G0344&elenco30giorni=false.

Menghini, S., 2016. *La filiera della birra artigianale toscana.* Milano: FrancoAngeli.

Microbirrifici.org, 2019. *Microbirrifici.org*. [Online] Available at:

https://www.microbirrifici.org/Microbirrifici_in_Italia_al_31122018_news.aspx.

Mosher, R., 2013. *Tasting beer. An insider's guide to the world's greatest drink.* Milano: Storey Publishing.

Mozzon, M., Boselli, E., Mieczyslaw, W. O. & Natale, G. F., 2015. Occurrence of biogenic amines in beers produced with malted organic Emmer wheat (*Triticum dicoccum*). *Food Additives & Contaminants: Part A*, 32(5), pp. 756-767.

Munroe, J. H., 2006. Fermentation. In Priest, F. G. and Stewart, G. G. (eds) *Handbook of Brewing*. II Edition. United States of America: CRC Press, pp. 487–524.

Pilatusbrau website, 2020. *Pilatusbrau*. [Online] Available at: https://pilatusbrau.ch.

Rastal, 2015. *Rastal beer catalog*. [Online] Available at: http://online.fliphtml5.com/abxs/mqzg/#p=4 (Accessed: 30 April 2020).

Regulation (EC) 1234/2007, 2007. EUR-Lex. [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007R1234&from=EN.

Regulation (EC) 1850/2006, 2006. EUR-Lex. [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1850&from=IT.

Regulation (EC) 1952/2005, 2005. EUR-Lex. [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32005R1952R(01)&from=IT.

Regulation (EU) 1308/2013, 2013. EUR-Lex. [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1308&from=EN.

Regulation (EU)1169/2011, 2011. EUR-Lex. [Online] Available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32011R1169&qid=1587318028037&from=IT.

Rissanen, M. & Tahvanainen, J., 2019. *Storia dell'Europa in 24 pinte. Dieci secoli di birra.* II Edition. Utet libri.

Rostirolla, M. & Rostirolla, P., 2008. *Un approccio multivariato e multicriteriale per l'analisi SWOT*.

Sabbaghi, A. & Vaidyanathan, G., 2004. SWOT Analysis and Theory of Constraint in Information Technology Projects. *Information Systems Education Journal*, 2(23), pp. 1–19.

Smith, S., Farrish, J., McCarroll, M. & Huseman, E., 2017. Examining the Craft Brew Industry: Identifying Research Needs. *International Journal of Hospitality Beverage Management*, 1(1).

Swinnen, J. F. M., 2011. *The Economics of Beer*. I Edition. Oxford: Oxford University Press.

Tepedelen, A., 2013. Power to the people. The ultimate hand-crafted beer is your next homebrew. *All about beer Magazine*. [Online] Available at: http://allaboutbeer.com/article/power-to-the-people/.

The Barth Report, 2014. Washington DC. [Online] Available at: https://www.barthhaas.com/fileadmin/user_upload/downloads/barth-berichte-broschueren/barth-berichte/englisch/2010-2020/barth-report-2014-2015.pdf.

The Barth Report, 2019. Washington DC. [Online] Available at: http://www.johnihaas.com/wp-content/uploads/2019/08/barthreport20182019efinal.pdf.

The Brewers of Europe, 2014. *Beer statistics*. Brussels, Belgium. [Online] Available at: https://brewersofeurope.org/uploads/mycms-files/documents/publications/2014/statistics_2014_web_2.pdf

The Brewers of Europe, 2019. *European beer trends*. Brussels, Belgium. [Online] Available at: https://brewersofeurope.org/uploads/mycms-files/documents/publications/2019/european-beer-trends-2019-web.pdf

The British Museum, 2020. *The British Museum website*. [Online] Available at: https://research.britishmuseum.org/research/collection_online/collection_object_details.aspx?assetId=273615001&objectId=368283&partId=1.

Turco, A., 2013. Del Teku e di come diventò il bicchiere simbolo della birra artigianale italiana. *Cronache di birra*. [Online] Available at: https://www.cronachedibirra.it/opinioni-e-tendenze/7065/del-teku-e-di-come-e-diventato-il-bicchiere-simbolo-della-birra-artigianale-italiana/

Turri, N., 2010. *Tecnologia della birra fatta in casa*. III Edition. Verona: Arsenale Publisher.

UnionBirrai, 2019. *UnionBirrai website*. [Online] Available at: https://www.unionbirrai.it/it/news/decreto-accise-pubblicato-in-gazzetta-ufficiale/.

Unionbirrai and ObiArt laboratory, 2019. *UnionBirrai Report*. Firenze. [Online] Available at: https://www.unionbirrai.it/it/news/report-ub-obiart-2018-birra-artigianale-filiera-italiana-e-mercato/

University of Leipzig, 2020. *University of Leipzig website*. [Online] Available at: https://www.ub.uni-leipzig.de:9000/54d8b146f3e91b134c000038/apps/55327c81569c2c2d3d000ed3/en.html.

Vaccarini, G., 2015. *Il manuale della birra*. Ravenna: Publi&Stampa.

Vandenberghe, J., 2015. The Single Common Market Organizzation Regulation. In McMahon, J. A. & Cardwell, M. N. (eds) *Research handbook on EU Agriculturae Law*. Edward Elgar Publishing, pp. 62–85.

Villatora, A. & Bettiol, M., 2017. *Il mercato delle birre artigianali in Italia*.

Wells, J., 2015. How Britain became hooked on homebrew. *The Telegraph*. [Online] Available at: https://www.telegraph.co.uk/men/the-filter/11803139/How-Britain-became-hooked-on-homebrew.html.

White, C. & Zainasheff, J., 2010. *Yeast: The Practical Guide to Beer Fermentation*. United States of America: Brewers Publications.

ANNEX I
CONSUMERS QUESTIONNAIRE

Welcome to the online questionnaire aimed at getting to know the CRAFT BEER CONSUMER.

We kindly ask you to answer some questions. The compilation will take only a few minutes and will be of great help for the development of a research within a master's thesis in Food and Beverage Innovation and Management of the Department of Agricultural, Food and Environmental Sciences (D3A) of the Polytechnic University of Marche (UNIVPM).
We emphasize that the questionnaire is anonymous and the data collected will be processed in aggregate form in compliance with the privacy law. *

We thank you in advance for your collaboration and availability.

Good compilation!

Michael Ausili (MD-Food and Beverage Innovation and Management thesis)

REFERENCES AND CONTACTS
Michael Ausili, Tel: + 39-339-8963539
e-mail: m.ausili94@tiscali.it

Professor Deborah Bentivoglio, Tel: + 39-071-220.4179
e-mail: d.bentivoglio@univpm.it

Agricultural, Food and Environmental Sciences Dept. (D3A)
Polytechnic University of Marche - UNIVPM
via Brecce Bianche - 60131 Ancona – ITALY

* PRIVACY OF DATA PROVIDED WITH THIS QUESTIONNAIRE

Pursuant to the law 675/1996 and the following Legislative Decree 196/2003, all the information collected with the questionnaires will be used exclusively for scientific research purposes (art.12, c. 1, point d). Furthermore, the data collected as part of this investigation are protected by statistical confidentiality and therefore cannot be communicated or outsourced except in aggregate form, so that no individual reference can be made to them, and can only be used for statistics purposes (art. 9 of Legislative Decree 6 September 1989, No. 322). Finally, the collected data will be made anonymous, during the computer processing, pursuant to art. 1, c. 2, point i) of law 675/1996.

*mandatory field

1- Age *
   - 18-25
   - 26-40
   - 41-60
   - 60+

2- Gender *
   - M
   - F

3- Educational qualification *
   - No formal education
   - Primary school
   - Middle school
   - High school
   - Degree

- Postgraduate training

4- Occupation *
    - Student
    - Housewife
    - Employee
    - Freelancer / Self-employed
    - Unemployed
    - Pensioner

5- Marital status *
    - Unmarried
    - Married

6- Family size (indicate the number of people in the family) *

7- Annual household income class *
    - Less than € 10.000
    - Between € 11.000 and € 20.000
    - Between € 21.000 and € 35.000
    - Between € 36.000 and € 50.000
    - Between € 51.000 and € 75.000
    - More than € 75.000

8- Region of residence *
    a. Abruzzo
    b. Basilicata
    c. Calabria
    d. Campania
    e. Emilia-Romagna
    f. Friuli-Venezia Giulia
    g. Lazio
    h. Liguria
    i. Lombardia

j. Marche
k. Molise
l. Piemonte
m. Puglia
n. Sardegna
o. Sicilia
p. Toscana
q. Trentino-Alto Adige
r. Umbria
s. Valle d'Aosta
t. Veneto

9- Residence *

- o Urban
- o Peri-urban

10- Do you consume beer? *

- o Yes → go to question 11
- o No → finish

11- Do you know craft beer? *

- o Yes → go to question 12
- o No → finish

12- What is craft beer for you? *

13- Do you consume CRAFT BEER? *

- o Yes → go to question 15
- o No → go to question 14

14- Why don't you consume craft beer? (indicate at most 2 answers) *

- □ Price
- □ Organoleptic and sensorial characteristics (taste, aroma, consistency etc.)
- □ I have difficulties finding it

- □ Alcohol content
- □ Little trust in small local producers / craftsmen
- □ Little advertised
- □ Other…

  → Finish

15- How long have you been drinking craft beer? *

- o Less than 1 year
- o 1-2 years
- o 3-5 years
- o More than 5 years

16- How often do you consume craft beer? *

- o Occasionally (1-2 times a month)
- o Poorly (once a week)
- o Frequently (several times a week)
- o Daily

17- Where do you consume craft beer? *

- o At home
- o Outside the home (pub, pizzeria, restaurant etc.)
- o Both indoors and out

18- When do you consume craft beer? *

- □ With meals
- □ When going out
- □ Parties
- □ Special occasions

19- Where do you mainly buy craft beer? (indicate at most 2 answers) *

- □ Supermarket / Large-scale retail trade
- □ Bar / pub / beer house
- □ Restaurant / pizzeria
- □ Beershop

- □ Brewpub
- □ Brewery
- □ Internet

20- What are the factors that lead you to buy craft beer rather than industrial beer? (choose 3 factors) *

- □ Richer and less standardized taste
- □ Production method
- □ Consistency (body of the beer)
- □ Aroma
- □ Alcoholic content
- □ Superior quality of craft beer compared to industrial beer
- □ Local origin / link with the territory
- □ Production with malt from local / regional / national cereals
- □ Price
- □ Brand awareness
- □ Availability of the product in distribution
- □ Packaging (label, bottle shape...)
- □ Originality and refinement
- □ Naturalness and genuineness
- □ Support for small producers

21- Indicate which value to attribute to LARGER AND LESS STANDARDIZED TASTE *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate which value to attribute to the PRODUCTION METHOD *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the CONSISTENCY (BODY OF THE BEER) *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the AROMA *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the ALCOHOLIC CONTENT *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the SUPERIOR QUALITY OF CRAFT BEER COMPARED TO INDUSTRIAL BEER *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the LOCAL ORIGIN / LINK WITH THE TERRITORY *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PRODUCTION WITH MALT FROM LOCAL / REGIONAL / NATIONAL CEREALS *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PRICE *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the BRAND AWARENESS *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the AVAILABILITY OF THE PRODUCT IN DISTRIBUTION *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PACKAGING (LABEL, BOTTLE SHAPE…) *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the ORIGINALITY AND REFINEMENT *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the NATURALNESS AND GENUINENESS *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the SUPPORT FOR SMALL PRODUCERS *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

22- Where do you mainly see the advertising of craft beer? (indicate maximum 2 answers) *

- □ Banner on specialized sites
- □ Brewery website
- □ Advertising / sponsorship of breweries on social networks (Facebook, Instagram, etc.)
- □ Billboards
- □ I have never seen advertisements for craft beer

23- Could you list some brands of craft beers that you usually consume?

THE QUESTIONNAIRE IS FINISHED

PLEASE PRESS THE "SEND" BUTTON IN ORDER TO REGISTER AND CONFIRM THE ANSWERS.

ANNEX II
CRAFT BREWERS QUESTIONNAIRE

Welcome to the online questionnaire that aims to analyse THE SECTOR OF CRAFT BEER AND ITS PRODUCTION.

We kindly ask you to answer some questions. Its compilation will take you only a few minutes and will be of great help for the development of a research within a master's thesis in Food and Beverage Innovation and Management of the Department of Agricultural, Food and Environmental Sciences (D3A) of the Polytechnic University of Marche (UNIVPM).

We emphasize that the questionnaire is anonymous and the data collected will be processed in aggregate form in compliance with the privacy law. *

We thank you in advance for your collaboration and availability.

Good compilation!

Michael Ausili (MD-Food and Beverage Innovation and Management thesis)

REFERENCES AND CONTACTS
Michael Ausili, Tel: + 39-339-8963539
e-mail: m.ausili94@tiscali.it

Professor Deborah Bentivoglio, Tel: + 39-071-220.4179
e-mail: d.bentivoglio@univpm.it

Agricultural, Food and Environmental Sciences Dept. (D3A)
Polytechnic University of Marche - UNIVPM
via Brecce Bianche - 60131 Ancona – ITALY

* PRIVACY OF DATA PROVIDED WITH THIS QUESTIONNAIRE

Pursuant to the law 675/1996 and the following Legislative Decree 196/2003, all the information collected with the questionnaires will be used exclusively for scientific research purposes (art.12, c. 1, point d). Furthermore, the data collected as part of this investigation are protected by statistical confidentiality and therefore cannot be communicated or outsourced except in aggregate form, so that no individual reference can be made to them, and can only be used for statistics purposes (art. 9 of Legislative Decree 6 September 1989, No. 322). Finally, the collected data will be made anonymous, during the computer processing, pursuant to art. 1, c. 2, point i) of law 675/1996.

*mandatory field

1- Name of the brewery *

2- Home of the brewery *
   a. Ancona
   b. Ascoli Piceno
   c. Fermo
   d. Macerata
   e. Pesaro-Urbino

3- Year of foundation of the brewery *

4- Type of brewery *
   □ Microbrewery
   □ Brewpub
   □ Beerfirm
   □ Agricultural brewery

5- Number of employees of the brewery *
   - 0 employees
   - Between 1 and 3 employees
   - Between 4 and 5 employees
   - More than 5 employees

6- Turnover class (year 2018) *
   a. Up to € 25.000
   b. Between € 25.000 and € 50.000
   c. Between € 50.000 and € 100.000
   d. Between € 100.000 and € 250.000
   e. Between € 250.000 and € 500.000
   f. More than € 500.000

7- Hectolitres of beer produced in 2018 *

8- Number of types of beer produced *

9- Beers produced are mainly: *
   - High fermentation beers
   - Low fermentation beers

10- What types of cereals / malts do you use for the production? *
   - □ Barley
   - □ Wheat
   - □ Rice
   - □ Corn
   - □ Spelt
   - □ Millet
   - □ Rye
   - □ Oat
   - □ Other…

11- Origin of cereals / malts purchased for production *

- ○ Italian only → go to question 16
- ○ Foreign only → go to question 12
- ○ Both Italian and foreign → go to question 13

12- From which foreign countries do you buy cereals / malts for the production? *

→ go to question 15

13- From which foreign countries do you buy cereals / malts for the production? *

→ go to question 14

14- In which percentage do you buy foreign cereals / malts? (e.g. if 50% enter 50) *

15- Why do you buy foreign cereals / malts? *

- □ Limited availability of national cereals
- □ Superior quality (in all its aspects) of foreign cereals compared to national ones
- □ Most advantageous price
- □ Other…

16- Do you use special ingredients for the production of your beer? *

- ○ Yes → go to question 17
- ○ No → go to question 18

17- What kind of special ingredients do you use? (e.g. pineapple, peach, elderberry, coffee, chili pepper …) *

18- Sales formats *

- □ Keg
- □ 33cl bottle
- □ 50cl bottle
- □ 75cl bottle
- □ Other…

19- Which sales channels do you mainly use? (select a maximum of 3 answers) *

- □ Direct sale at the brewery
- □ Supermarkets / Large-distribution scale

- □ Online sale
- □ Specialized stores (beershops)
- □ Bars, pubs, restaurants, pizzerias
- □ Fairs, demonstrations, events
- □ Other…

20- On what scale do you make sales? *

- ○ National → go to question 24
- ○ Foreign → go to question 21
- ○ Both national and foreign → go to question 22

21- In which countries do you export your craft beer? *

→ go to question 24

22- In which countries do you export your craft beer? *

→ go to question 23

23- On the total of your production, how much does the export weigh in %? (e.g. if you export 10% of the total of your production, enter 10) *

24- How do you mainly advertise your craft beer? (indicate a maximum of 3 answers) *

- □ Tasting events
- □ Collaborations with other breweries
- □ Fairs and events
- □ Events inside the brewery
- □ Participation in brewery competitions
- □ Social Network (Facebook, Instagram, Twitter, etc.)
- □ Traditional advertising (press advertising, billboards, etc.)
- □ Paid advertising on specialized sites or social networks
- □ Company website or blog
- □ I don't advertise it
- □ Other…

25- Do you think craft beer is poorly advertised? *

- Yes
- No

26- How do you rate consumers' knowledge of craft beer? *

- Excellent
- Good
- Poor
- Absent

27- What are the 3 factors you consider most important in the production of your beer? *

- □ Quality of the finished product
- □ Production quantity
- □ Originality and refinement
- □ Naturalness and genuineness
- □ Use of local / regional / national cereals / malts
- □ Promotion and enhancement of the territory
- □ Price
- □ Customer loyalty
- □ Packaging (label, bottle shape ...)

28- Indicate which value to attribute to the QUALITY OF THE FINISHED PRODUCT *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PRODUCTION QUANTITY *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the ORIGINALITY AND REFINEMENT *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the NATURALNESS AND GENUINENESS *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the USE OF LOCAL / REGIONAL / NATIONAL CEREALS / MALTS*
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PROMOTION AND ENHANCEMENT OF THE TERRITORY *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PRICE *
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the CUSTOMER LOYALTY*
(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

Indicate what value to attribute to the PACKAGING (LABEL, BOTTLE SHAPE…) *

(where 1: not at all important; 2: unimportant; 3: indifferent; 4: important; 5: very important)

	1	2	3	4	5	
not at all important	○	○	○	○	○	very important

29- Indicate the 2 main STRENGHTS of your brewery *

30- Indicate the 2 main WEAKNESSES of your brewery *

31- Indicate the 2 main OPPORTUNITIES that you could take for your brewery *

32- Indicate the 2 main THREATS that affect / could adversely affect your brewery *

33- In what area would you like to make future investments? *

34- Would you be interested in becoming an agricultural brewery? *

- Yes → go to question 35
- No → go to question 36
- I'm already an agricultural brewery → go to question 36

35- Why? *

36- Age of the brewery owner *

- 18-25
- 26-40
- 41-60
- 60 +

37- Gender of the brewery owner *

- M
- F

38- Educational qualification of the brewery owner *

- ○ No formal education
- ○ Primary school
- ○ Middle school
- ○ High school
- ○ Degree
- ○ Postgraduate training

39- What are the reasons that led you to enter the world of craft beer? *

- □ Homebrewing activity
- □ Training or qualification course
- □ Professional experience gained in the beer sector
- □ Tasting course
- □ Business opportunity
- □ Passion
- □ Other…

THE QUESTIONNAIRE IS FINISHED

PLEASE PRESS THE "SEND" BUTTON IN ORDER TO REGISTER AND CONFIRM THE ANSWERS.