Technological Analysis

Points 1- 2 - 3

UNIVERSITÀ DEGLI STUDI DI CAGLIARI

CREA UniCa
CENTRO SERVIZI DI ATENEO PER L'INNOVAZIONE E L'IMPRENDITORIALITÀ

BESTMEDGRAPE

New Business opportunities & Environmental SusTainability using MED GRAPE nano technological products

Introduction

This work will be articulated through an analysis of the main economic sectors of interest for obtaining and supplying the by-products from winemaking, as well as the range of possible uses for obtaining innovative products, with particular attention to the concepts of economics circular and social and environmental sustainability. Following the focus of the BESTMEDGRAPE project, particular attention was paid to the analysis of the cosmetic sector and the nutraceutical sector (respectively contiguous, in terms of distribution and marketing channels). A brief analysis of the other methods of use is provided to provide, by difference, a cross-section of the entire market of wine-making by-products.

An entire paragraph has been dedicated to an in-depth analysis of the legislation relating to the disposal of residues from winemaking, as well as to the main certifications for obtaining and maintaining the reference standards for the "Food, health and beauty" sector:

- Certification of good manufacture of cosmetics (ISO27716),
- Food safety certification (ISO22000),

as well as quality and environmental sustainability certifications:

- Quality certification (ISO9000),
- Environmental sustainability certification (ISO14001)

Above all, the first two seem to be fundamental in order to develop business projects relating to the production and marketing of cosmetic and nutraceutical products from the waste of wine production. Furthermore, potential opportunities deriving from obtaining "B Corp" certification and / or from the passage to status of "B Corporation" are taken into consideration.

Finally, we proceeded with an analysis of the main stakeholders in the wine, cosmetic and nutraceutical sector, which are followed by reflections on the possible interactions between them with a view to developing an innovative business that exploits the existing supply chains to produce, distribute and to market products deriving from the waste of wine production.

The Italian wine industry

Industry by numbers[1]

In Italy, the wine sector has about 2,000 industrial companies and invoices over 11 billion Euros (approximately 8% of the national turnover of the Food & Beverage sector).

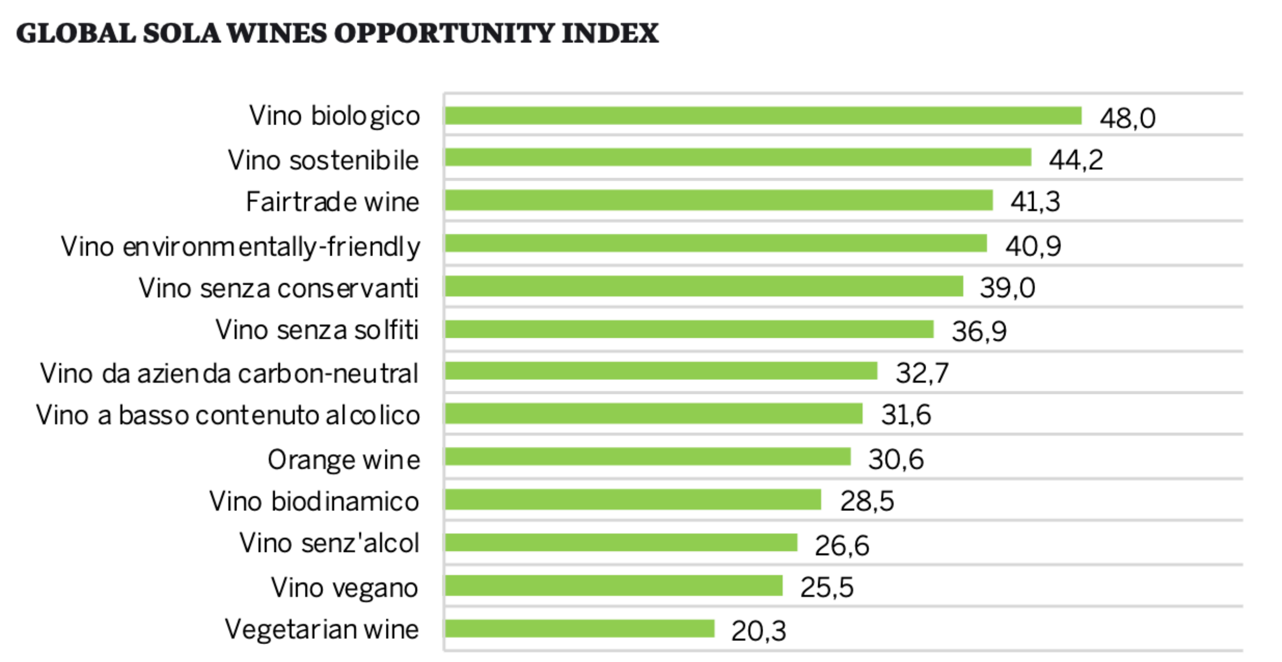
In reality, the wine supply chain is very complex and there are many actors taking part in the production process: there are over 300,000 farms, of which about 47,000 winemakers, about 9,000 bottlers. Italian production (in value) in 2019 reached 11.3 billion euros, of which 6.2 billion (54%) of exports. As regards production in terms of volumes, with more than 50 million hectoliters, for the 4th consecutive year Italy ranks first in production, the equivalent of 17% of world production. The hectares of "vine" cultivation on the Italian territory are 651 thousand and the collected tons exceed 65 million.

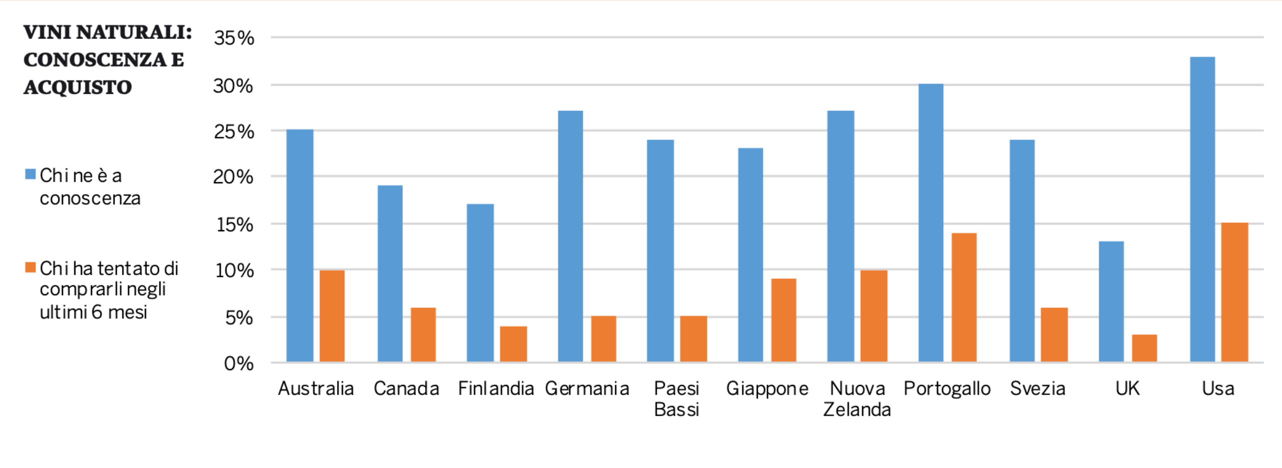
Another all-Italian record concerns the number of PDO and PGI wines; with 523 certified products Italy holds the primacy in Europe over a total of 1586 certified wines, followed by France (435), Greece (147), Spain (131) and Portugal (40)

[1]Dati: “Industry Report 2019” (dati 2018) - UniCredit e Corriere Vinicolo, “Vino in Cifre” N1. - 13 Gennaio 2020

In line with the growing demand for organic wines, the expansion of the organic cultivation of vines continues, whose surface has exceeded 100,000 hectares, 16% of the entire national area cultivated with vines. Some regions are specializing in the production of organic wine: Basilicata (with 52% of the total area dedicated to the cultivation of organic vines), Calabria (48%), Sicily (36%) and Marche (31%).

VINI BIOLOGICI
Opportunity Index Score - Opportunity Index Score per paesi





The production fabric is fragmented, with an average company size of 10 employees per company. The small size is however a characteristic of the sector also at European level.

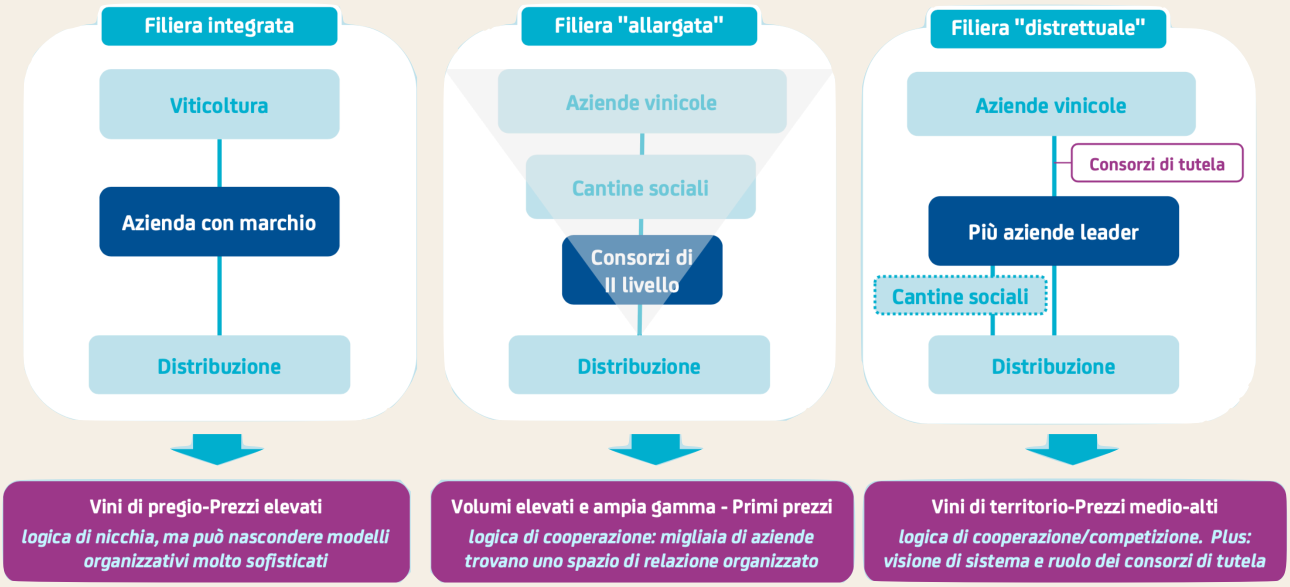
The level of concentration is therefore very low: the first 4 companies hold just over 10% of the production in value.

The network of activities necessary to produce and market a bottle of wine, however, involves many actors, not always industrial companies. There are many agricultural enterprises that make wine, directly selling the bulk product or organizing themselves in cooperatives. The cooperatives (wineries and consortia) are worth about 40% of the sector's total turnover and about 60% of the national wine production by volume. *

By keeping the "short" supply chain out, which sees the small producer selling his own wine directly, the organization of the network of activities connected with the production and marketing of wine belongs, simplifying, to three supply chain models. Each model is organized around a strong subject (indicated in blue in the diagrams below) and responds to different positioning strategies on the market.

Actors typologies

- Large companies: present at all stages of the process, which can vinify both the grapes produced in their own estates, and grapes purchased from other local and non-local producers
- Social cellars: often in cooperative form, they make wine from the grapes brought in by the members, bottle and market
- Consortia: they bottle and market the wine purchased from winemaking companies
- Protection consortia: They do not carry out production activities, but implement the EU directives on production regulations, ascertain and control compliance, promote the denomination
- Wineries: Farms that make wine and sell the bulk product
- Bottling companies: they buy bulk wine and operate only in the bottling phase. They can work for third parties for wine producers.



Focus on distilleries[2]

Distillation products

The distillery sector creates a wide range of products that are not limited to the food sector. In addition to spirits and grappas, in fact, it produces oils, feed, organic acids - such as tartaric acid of which Italy is a world leader - bioethanol, fertilizers. Furthermore, all the residues from the distillation process are sent to combustion to produce green energy (biogas), another important product of distillation. The distillation process (which can be continuous or discontinuous) varies according to the raw materials used and the desired final product.

[2] Source: AssoDistil - National Association of Industrial Alcohol and Brandy Distillers

ALCOHOLS
The first products of the distillation process are alcohols, usually considered for food use. However, in the last century there has been an increase in their industrial use. In fact, technology has made it possible to allocate alcohols to functions other than "mouth" ones. For years they have been used for the production of solvents and paints; they are also used in perfumery and pharmacology.

SPIRITS
The brandy is the product resulting from the distillation of various raw materials, including wine, pomace, cereals, fruit. Based on the raw material used, different types of brandy are born, such as the Geographical Indications Grappa and Italian Brandy.

GRAPPA
Grappa is "pomace brandy, obtained from raw materials obtained from grapes produced and vinified in Italy, distilled and processed in plants located on the national territory". Not to be confused therefore with the generic term brandy (spirits, fruit, must or other essences), nor with wine spirits (such as brandy or cognac). National production

BRANDY
Brandy is a brandy of wine aged at least one year in oak barrels. In particular, the IG Italian Brandy was recognized through the decree of 16 June 2016, is obtained from the distillation of wine from grapes grown and vinified on the national territory.

ORGANIC ACIDS
Organic acids are present in many fruits and in considerable quantities in grapes. Among these, natural tartaric acid, residue of the distillation process, can be used in the food industry as an acidifier and natural preservative, and as a leavening agent; it is also used in the pharmaceutical industry as an excipient (European Pharmacopoeia legislation) and in the cosmetic industry as a base of natural creams.

FERTILIZER
The borlanda is the residue obtained from the distillation of wine and wine by-products. It has a high organic nitrogen content capable of activating the microbial flora of the soil. For this reason it is used as a fertilizer in particular in organic agriculture. In liquid form, it is able to optimize soil yields, reducing the need for irrigation.

BIOETHANOL
In the last 40 years, bioethanol has been increasingly synonymous with energy and alcohol used as fuel is involving an increasingly large part of the world distillery industry. In many ways in Italy it is a story yet to be written, but in other countries it is already a reality: ethyl alcohol of agricultural origin is a renewable source of energy, an alternative to sources of fossil raw materials, both directly as a fuel with polluting residue zero, and, indirectly, for the production of high-octane ethers and finally of hydrogen, another source of energy with zero polluting residue. An already concrete realization of ether is ETBE, an anti-detonant used in gasoline instead of tetra-ethyl lead (highly toxic) deriving from an etherification process of which bioethanol represents just under 50%.
Italian industrial distillers have already been ready for some time, with industrial technologies and structures, to make their contribution to the protection of the natural environment with the production of a renewable and ecological source of energy, such as ethyl alcohol distilled from agricultural raw materials .

BIOGAS
Following the de-alcoholic and / or vinellation processes aimed at the production of alcohol and spirits, another type of by-product is also obtained, the borlanda, which by virtue of its characteristics is effectively used in the production of biogas. The borlande are a compound of water and substances not altered by fermentation, such as cellulose, fats, nitrogen and ash. They can be subjected to anaerobic digestion processes or to degradation of the organic substance by means of microorganisms that live in anaerobic conditions. Finally, biogas is obtained from these processes, a mixture composed of variable percentages of methane between 50 and 70% of the total, depending on the substrate used. Through this production process, biogas can be considered a by-product of distillation pursuant to art. 2 bis of Law Decree 171/2008 converted with amendments by Law 30 December

2008, n. 205, where it is intended for combustion in the same production cycle.**OLI ESSENZIALI**
Dalla distillazione in corrente di vapore si ottengono gli oli essenziali. In pratica questa procedura permette la produzione di oli di alta qualità. In questo modo attraverso il vapore la pianta diffonde le sue sostanze volatili che attraverso il processo di refrigerazione riprendono consistenza e assumono la forma di piccole gocce. Le stesse di cui sono composti gli oli essenziali.

Distilleries by numbers

Alcohols and spirits: the world and European production scenario

The world budget of 2018 ethyl alcohol, according to F.o. Licht, with 1 billion and 276 million hl* exceeds the volumes produced in 2017 by 9%. The USA, with 623 million hl continue to be the leading producer country, with a share of around 50% of world production. According to the estimates provided by the European Commission in the ethyl alcohol balance, the production of the Old Continent represents about 7% of the world production with a volume of 90 million hectares.
At European level, the countries with the most significant weight in terms of production are France with 23% and Germany with 16%, followed by the United Kingdom with 12% and Hungary which holds 9%. Italy maintains its share constant, settling on 1% of the total produced in the EU.

Also in 2018 the main raw material used in the production of ethyl alcohol were the cereals which, together with the by-products of sugar - molasses - contributed, overall, more than 90% to total production.

The production of wine alcohols and vinous materials remains stable and represents a share of over 3%. Estimates of the use of European ethyl alcohol indicate that over 70% of production has been destined for the fuel market segment, with a value of just under 65 million hectoliters.

Trend e considerations

Ethyl alcohol of agricultural origin (NC2207 - Alcohols)

In 2018, the Italian production of ethyl alcohol (NC 2207) was 902,400 hectares, a volume substantially stable compared to the previous year. In particular:

- Wine alcohol: in 2018 the volumes of wine alcohol recorded substantial stability, settling on the 4,000 hectoliters produced, volume unchanged compared to 2017.

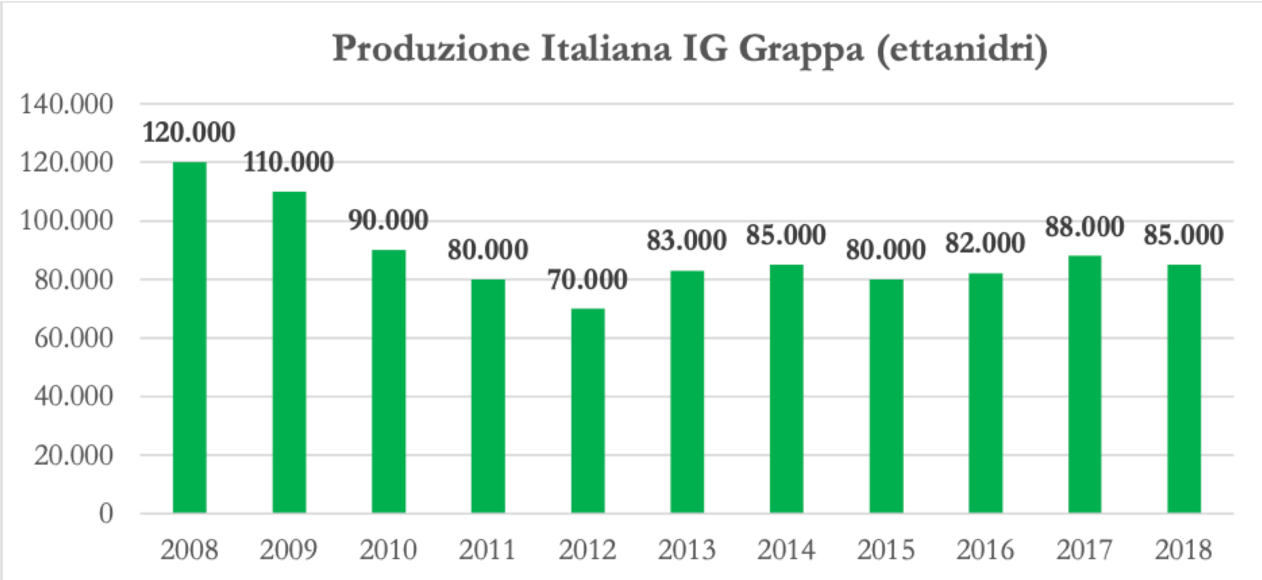
- Alcohol from cereals: in 2018 cereals are confirmed as the main raw material distilled in Italy, with a production volume of 649,000 hectares of alcohol, substantially unchanged compared to the previous year. However, it should be noted that the trend in recent years is generally positive if we consider that since 2013, production has increased steadily (+ 5.5% compared to 2015 and + 16% compared to 2013).

The spirits (NC2208 - Brandy / Grappa / Brandy)

In 2018, the Italian production of spirits was 98,700 hectares, a decrease of 6% compared to the previous year. This year, the production of spirits is slightly below 100,000 hectares, substantially due to the reduction in the production volumes of wine spirits compared to the stability of the spirits deriving from other raw materials. In particular:

- Fruit and grape spirits: in 2018 the production of fruit and grape spirits decreased slightly compared to last year, with a volume of 12,600 hectares compared to 13,500 in 2017. However, production in 2018 is increasing compared to at the value recorded in 2016 (11,100 hectares), so the trend in the last two years has been substantially stable even if at lower levels than those of the period 2011-2015 when production also reached peaks of 20,000 hectares

- Grappa: in 2018 the production of Grappa was 85,000 hectares, a volume decrease of 3% compared to last year. The trend of the brandy symbol of Made in Italy over the past 10 years can be summarized in two macro-trends. The 2008-2012 five-year period was characterized by a constant and significant reduction in production (-41%), to then stabilize from 2013 with an average production of about 84,000 hectares per year. 2018 reflects the trend of the past 5 years. It can be estimated that the production of Grappa in Italy is equivalent to the distillation of around 150,000 tons of marc.



Fonte: AssoDistil

- Wine spirits and Brandy: The data relating to the production of wine spirits show that the volumes decreased further in 2018, reaching 1,100 hectares, a reduction of 63% compared to 2017. Comparing the latest available data with the production of the year 2010 the reduction in the volumes of wine brandy is about 99%!

- From the data shown and considering in particular the Italian context and the types of products useful for the purposes of this document, we can deduce an almost stable market, which however highlights some negative trends for some products, in particular for spirits (-6%), with Grappa down by 3%, but in line with the average for the period 2013-2017, an average which, however, comes after a precipitous drop (-41%) between 2008 and 2011.

- An even more disastrous scenario is that of wine spirits and Brandy, with a 63% YoY (Year on Year) drop, and a 99% drop since 2010.

- If considered from a supply chain perspective, these negative trends can be significant especially considering instead the positive growth trends recorded (worldwide and nationally) by the wine sector alone. As wine production grows, in fact, there is a contraction in the production of some products of the distillery industry, especially those that use vinification by-products as raw material, which find their main interlocutor in the distilleries for the disposal of these rejects. This therefore suggests a window of increasing space for the methods of disposal / reuse (alternative to the transfer to the distillery) of these by-products.

- A similar case occurred in Australia as early as the late 1990s and in 2001 it was subjected to a dedicated study by the company "PPK Environment & Infrastructure", commissioned by the EPA - Environmental Protection Authority, of the Government of South Australia . The basis of the study was the need to find concrete answers on the issue of the management of the disposal of by-products from winemaking (especially of their "solid part", the marc), especially in light of some production / consumption trends in the wine supply chain. Also in the Australian case, the sector trends showed important growth trends, while those of the distillery sector recorded a contraction in consumption, a combination that therefore posed urgency in finding alternative methods for the disposal / management of the by-products of winemaking, which were simultaneously respectful of the environmentally and economically advantageous.

- Returning to the Italian context, a concrete element that seems to be a symptom of the above is Decree no. 3116 of 30 May 2019, with which the Mipaaf (Ministry of Agricultural, Food and Forestry Policies) increased the allocation of funds linked to the measure of support for the distillation of by-products for the year 2019 to 21 million euros, compared to the usual 20 million, to meet the needs of a vintage characterized by above average production. The measurement of the distillation of by-products gives more than it receives and plays a fundamental role for the whole wine production chain.

- Finally, another detail that is linked to one of the trends highlighted above, concerns grappas. The slight drop in consumption in absolute terms was also accompanied by a significant increase in the consumption of "quality" grappas, which provide for the separation of the grape seeds and the stalks from the marc, the latter usually already removed by the wine producers. It therefore becomes relevant that the decrease in production previously highlighted, however, was accompanied by a gradual increase in quality, as revealed in a recent interview with Esquire, the president of the association ANAG - Grappa and Acquaviti tasters, Paola Soldi, who says that at this time grappas are characterized by a greater attention to perfumes and "cleanliness" and the percentage of productions aged in wooden barrels has grown considerably: "All distilleries have increased the aging cellars, doubling if not tripling the number of the barrels. And we know for sure that the bottles received for the competitions are a good 60-65% of the aged product ".

This suggests that some actors of the distillery sector, intuitively the most important in terms of size and production capacity, are equipped with special machinery specialized in the separation of the grape seeds from the pomace, which appears to be relevant for the purposes of this analysis with a view to provide a better analysis of the supply chain, its actors and possible sources of supply of the raw material.

Italian regulatory framework for wine-making by-products

Decree n. 7407 of August 4, 2010

ART. 1

Article 5 of the ministerial decree of 27 November 2008, no. 5396, cited in the introduction, is replaced by the following:

ART. 5

WITHDRAWAL UNDER CONTROL

1. Producers who, in application of articles 22 and following of EC regulation no. 555/2008 of the Commission, are required to withdraw the by-products of winemaking, fulfill their obligation with the delivery, in whole or in part, to the distillery or through the withdrawal under control for the following alternative uses:

a) Direct agronomic use, through the distribution of by-products on agricultural land, within the limit of 3,000 kg per hectare of agricultural area resulting in the farm file, on condition of an express commitment to use the by-products for agronomic use

b) Indirect agronomic use, through the use of by-products for the preparation of fertilizers.

c) Energy use, through the use of by-products such as biomass for the production of biogas or to power plants for the production of energy, also used in conjunction with other energy sources destined for the production of biogas or combustible biomass.

d) Pharmaceutical use, through the use of by-products for the preparation of drugs.

e) Cosmetic use, through the use of by-products for the preparation of cosmetics.

The pomace intended for the extraction of enocyanine or for the production of agri-food products referred to in Annex 2 to this decree, are considered to be used for alternative use. The use of pomace for the production of further agri-food products is authorized by the General Directorate of Community and international market policies upon request from the Regions and autonomous Provinces.

The by-products obtained from the transformation of wine grapes into products other than must and wine are subjected to shrinkage under control; in this case, art. 4 of this decree. The Regions and the autonomous Provinces establish the timing and methods of distribution of the by-products for agronomic use in relation to the maintenance of the fertility and the structure of the agricultural surfaces used, providing for exclusions or limitations of areas to be used for the intervention and, also establish the provisions applications for the use of by-products for other alternative uses, other than those referred to in paragraph 1, providing for exclusions and limitations in relation to specific regional regulations.

The producers who allocate the by-products to alternative uses, make the communication by filling in the form attached 2 bis to this decree and send it, by fax or e-mail, at least within the fourth day before the start of the collection operations, to the peripheral office of the territorially competent ICQRF, except as provided in article 15. This communication must contain at least:

a) the nature and quantity of the by-products;

b) the place where they are deposited;

c) the type of destination;

d) the day and time of the beginning of the operations intended to render it unusable for human consumption or of the beginning of the transport to the plant where the by-products are used. If the elimination of by-products takes place over several days, the collection / delivery plan of the by-products must also be indicated;

e) in the case of agronomic use of by-products, the commitment of the producer to their distribution on the agricultural land present in the company files;

f) in the case of use of the by-products by a person other than the manufacturer, the name or company name, tax code and VAT number of the recipient company must also be indicated, as well as the relative address.

In application of art. 47, paragraph 1, letter j) of Regulation (EC) no. 436/2009, on the loading and unloading register kept by the producer, the unloading of the lees or marc destined for collection under control or for alternative uses is noted, on the day in which the collection operation is carried out and before the operation itself ; in the "description" column, among other things, the reference to the communication and the date of transmission of the same to the control bodies.

The communications referred to in paragraph 5 bear the load and unload register code kept by the manufacturer, attributed by the ICQRF. A copy of the communication escorting the transport of the withdrawn by-product and is shown at the request of the body that controls the withdrawal operations. Communications are kept for five years. The exemptions and authorizations granted pursuant to this decree remain valid.

For the purposes of qualifying the materials envisaged by this decree as by-products, the provisions of the fourth part of the legislative decree n. 152/2006 and the provisions governing the characteristics and conditions of use of the products, such as those in force regarding fertilizers or fuels. "

ART. 2

1. Paragraph 1 of article 15 of the ministerial decree of 27 November 2008, no. 5396, cited in the introduction, is replaced by the following:

1. "The checks are carried out by:

- ICQRF, to verify that producers fulfill the obligation of delivery to distillers in compliance with the provisions of EU and national legislation as well as, in collaboration with the State Forestry Corps, for the alternative uses referred to in art. 5, paragraphs 1 and 2. The control guarantees compliance with Article 79 of Regulation (EC) no. 555/2008.

- Region, or by a body identified by it, if they issue control provisions for the cases of withdrawal under control provided for in Article 5, paragraph 1, letters a) and c), and paragraph 4 of this decree, informing the ICQRF. In this case, the communication referred to in Article 5, paragraph 5, is also sent to the Region or control body identified by it. The control guarantees compliance with Article 79 of Regulation (EC) no. 555/2008.

- Competent offices of the Customs Agency at the distillers and users of raw alcohol, to ensure compliance with art. 77 of Reg. (CE) n. 555/2008, in agreement with Agea-paying agency. " This decree is sent to the control body for registration and enters into force the day following that of its publication in the Official Journal of the Italian Republic.

Rome, 4th August 2010

Law 12 December 2016, n. 238

1.The keeping of the marc in the oenological establishments is prohibited from the thirtieth day from the end of the period referred to in article 10, paragraph 1, or, if the marc is obtained in a different period, from the thirtieth day following that of the obtaining. The holding of undenatured lees in oenological establishments is prohibited from the thirtieth day following that of obtaining them. The terms referred to in this paragraph are raised to the ninetieth day for producers of quantities less than 1,000 hectoliters.

2. Except for the cases of exemption for withdrawal under control provided for by current European Union and national legislation, as well as for marc destined for alternative uses, including those for the extraction of enocyanine, marc and lees of wine in any case obtained from the transformation of grapes and wine products must be sent directly to the recognized distilleries.

3. Distilleries as well as those who use the by-products of the transformation of wine products for energy purposes are allowed to set up temporary collection centers outside the factory, subject to communication to be sent to the local office, provided that they are in establishments other than cellars and establishments. winemaking, with the exception of those where only denatured wine products are

introduced and extracted. The transfer of lees and marc, not yet started for distillation, is also permitted between authorized distilleries and among users of the by-products of the transformation of wine products for energy purposes.

4. The possession of marc destined for uses other than distillation, including the extraction of enocyanine, is communicated in advance by the managers of the industrial user plants to the local office. The communication, on free paper, is valid for a wine year and must arrive prior to the first introduction of marc and contain the indication of the address of the pomace holding plant and the total quantity that is expected to be introduced during the wine year of reference.

5. The lees of wine, before being extracted from the cellars, are denatured with the revealing substances and with the methods identified by the Minister's decree.

6. The preparation of the wine is allowed:
a) at distilleries and factories for the exploitation of by-products of winemaking; b) at the cellars of the winemakers who make their own grapes with a capacity of not more than 25 hectoliters of wine, provided that no more than 5 hectoliters of them are produced and that they are used exclusively for family or business use.

7. Water and other substances obtained in the concentration processes of musts or wines or in that of regeneration of ion exchange resins are denatured, upon obtaining it, with the revealing substances and according to the methods identified by decree of the Minister.

"*Wine by-products*" and their areas of use[3]

According to current legislation, the by-products deriving from winemaking are subject to management methods which, with defined timescales, provide for the obligation of total or partial delivery to the distillery, or of their controlled reuse for alternative uses. In both cases, the correct annotation of the relative operations on the winemaking register is a must. The legislation excludes companies with a production level of less than 25 hL of wine from the obligation.
Considering that the Italian production of wine grapes is about 53 million quintals, equal to 45 million hectoliters of wine (data OIV - Italian Wine Organization), the potential quantity of residues is estimated at 8 million quintals of marc (including grape seeds, equal to 15% of the vinified grape) and 2,250,000 hL of lees (equal to 5% of the wine produced). In reality, since 5% of the Italian wine comes (estimate based on the reality of Piedmont) from wineries not required to transfer the grape-marc to the distillery or to use them alternatively, the real national quantity of grape marc and lees available for each vintage estimated respectively in 7,600 million quintals of grape marc and 2,140 million quintals of lees.

Types of wine-by products

PRUNING RESIDUES

In the grape production process, the main residue is made up of prunings removed with winter pruning. They are traditionally burned on the field, but this operation is increasingly sporadic since it is considered ecologically incorrect, both because of the emission of fumes, and because of the

[3] 33/2015 - L'informatore Agrario

immediate mineralization of the organic substance (without the possibility of formation of humus) that the operation entails. In place of this practice, the prunings are increasingly shredded and buried, being a source of organic substance in the soil (with an annual replenishment equal to about a quarter of the required quota) and of natural nutrients deriving from slow mineralization. An alternative is their use for the production of energy as a bio-mass. This type of use of pruning residues brings advantages, such as increasing the energy autonomy of farms, if enhanced, saving fossil energy, diversifying sources of income, if sold outside, triggering a series of positive economic, employment and environmental effects. This transforms residues from a problem, with disposal costs, into a resource. The pruning residues can amount to a few tons per hectare, with variable production depending on the strength of the vine and the form of training; also the energy yield varies according to numerous factors. In general, the annual biomass per hectare is between 1.5 and 3 t, and provides energy equivalent to 0.5-0.9 t of diesel.

Another possible destination for pruning residues is composting, which is scarcely used by wine companies. With the administration of water and urea (e.g. 2 g / kg of dry matter), the C / N ratio of the compost obtained is reduced from about 60 to 40: the latter value corresponds to a nitrogen content of about 1, 2%, sufficient to allow the multiplication of microorganisms active in the metabolic processes that take place within the substrate. Often the compost is obtained by mixing the pruning residues, suitably shredded, with the pomace and lees derived from winemaking.

GRAPE POMACE, GRAPE SEED AND LEES

The conferment or reuse of the marc must be completed within 30 days from the end of the harvest period, with the exception of those obtained from the production of wines for which the fermentation period can last beyond 31 December (saints, raisins, late harvests). In this case, their delivery to the distillery or the start of alternative uses must be completed within 30 days from the date of separation of the marc (racking) or, for the lees, within 30 days from the date of their obtaining.

Sanctions are provided for those who do not comply with the relevant regulations (law 82 of 2006):

- non-compliance with the obligation to deliver to distillation or withdrawal under control: up to 1,000 euros;
- holding of pomace in oenological establishments beyond the thirtieth day from the end of the harvest period: up to 3,000 euros;
- non-compliance with the obligation to de-naturalize the lees of wine before they are extracted from the cellars, or denaturing them in accordance with the provisions of the law: from 100 to 5,000 euros.

ALLOWED ALTERNATIVE USES.

Regulated regionally by art. 5 of the Mipaaf decree of 27-11-2008, are the following:

- direct spreading on land for agronomic use;
- composting and subsequent agronomic use;
- energy use through transfer to biogas or incineration plant;
- pharmaceutical and / or cosmetic use;
- food use, extraction of oenocyanin;
- zootechnical use, in the preparation of animal diets, animal feeds.

For alternative non-agronomic use (see box above), the grape marc and lees must be denatured with the addition of lithium chloride (5- 10 g / hL) or pastoral salt (1 kg / q of marc), denaturation which, unfortunately, is not always carried out accurately and efficiently.

These alternative uses, in particular agronomic use, are conditioned by the composition of the by-products (marc with or without stalks): the quantity of marc distributed must not exceed 3,000 kg / ha, with a maximum nitrogen supply of 50 kg / ha (quantity that must be kept in mind according to the nitrates directive). It is to be considered that the distribution of marc directly to the vineyard, even if in the form of compost, provides modest quantities of mineral salts, but can increase the salinity level of the soil and bring heavy metals.
Alternative uses are limited and conditioned by precise rules to avoid pollution and environmental damage. In any case, the quantitative limitation in agronomic use (3-4 q / ha) means that most of the marc cannot be disposed of in this way and therefore makes this system ineffective for the use of by-products. of winemaking.

DELIVERY TO THE DISTILLERY.

In this case, the residues represent an integration of income for the wine producer: by estimating an average price of 2.2 euros / q of marc (with values that can even reach 9 euros for particular lots, eg. in Trentino) and an average price for lees of 4.5 euros / q, 1 ha of vineyards with a yield of 100 q of grapes can acquire an additional income of 52 euros (100 q of grapes × 0.15 = 15q of marc × 2.2 € / q = 33 €; 85hL wine × 0.05 = 4.5 q of marc × 4.5 € / q = 19.13 €). The advantage for the cellar increases if one considers the saving of a disposal cost, such as waste, of at least equal amounts. If in principle (but only in principle, because the marc, like all agricultural products, are available in a limited period of time and it is not easy to manage its storage) alternative uses are possible for the marc, such as the energy one, for the lees there is none. The transfer by distillation establishes a positive cycle with an advantage for the producer and for the distillery.
The rule on the transfer to distilleries has the aim of avoiding excessive overpressing or pressing for the production of poor wines, fraud, smuggling, etc. and therefore constitutes a guarantee for the entire wine sector. In particular, for the individual winery, the rapid withdrawal of the marc is a valuable aid in the most delicate moment of the life of the winery, that of the introduction and fermentation of the grapes: in fact, it allows to avoid the start of secondary fermentations near the environments of wine-making a process that harms the quality of wines in fermentation (and / or aging). In practice, the management of the environmental impact of wine production is transferred to the distillery, which has dedicated plants. Residues that can represent a problem for the cellar become raw material for the distillery, which obtains products of high commercial value, while at the same time recycling potentially polluting materials.

WHAT COMES FROM POMACE, GRAPE SEED AND LEES

The list of products obtainable from winemaking products is very rich. Numerous substances are obtained from these which have various uses.

From grave Marc (pomace): grappa or alcohols (for food and / or industrial use), natural tartaric acid, lactic acid, citric acid, proteins, bio-emulsifiers, bio-surfactants, tannins, polyphenols, anti-allergens, hydrolytic enzymes, bioethanol, fertilizers, soil improvers, compost (in association with pruning residues), absorbents for decontamination of heavy metals, substrates for human food or for microorganisms (in association with pruning residues), bio-control agents, electricity (in association with residues of pruning). The by-products of the cellar can also become a substrate for anaerobic digestion aimed at the production of VFA (Volatile fatty acid). VFA are short chain fatty acids, conventionally up to 6 carbon atoms, which can be used industrially within the "Carboxylation platform" to produce energy, chemicals or bio-materials.

From grave seeds: tannins, antioxidants, antimicrobials, flour, oil, cosmetics, biodiesel, lubricants.

From lees: alcohols for food and industrial use, calcium tartrate, natural tartaric acid, dyes, ethanol, beta-glucans, food.

Evaluation and enhancement of by-products

How much pomace and lees are worth

- 2.2 euros/q average price for pomace[4]
- 4,5 euros/q average price for lees euro/q
- 52 euros/ha for a production of 100 q/ha

Considering a production of 53 million quintals of grapes, equal to 45 million hectoliters of wine (given OIV - Italian Wine Organization)

- 7.6-8 million quintals of pomace (of which 15% grape seeds, equal to 1.2 million quintals)
- 2.1-2.25 million hectoliters of lees.

The Italian cosmetic industry

Industry by numbers[5]

Market value

Even in 2018, despite the political economic scenario characterized by profound uncertainty, the Italian cosmetic sector recorded significant growth both in the internal market and in the values of the industry. Once again, the counter-cyclical characteristic of the sector is confirmed, with average rates always higher than the other sectors of national consumer goods. Internal consumption of cosmetics, i.e. the value of consumer purchases, exceeds 10,100 million euros, for an increase of 1.3%, confirming the impermeability to the negative conjunctures of the Italian market.

Production value

The turnover of the cosmetic industry, i.e. the value of production, recorded an increase of 2.1% on the previous year, with a value of 11,390 million euros. The cosmetic industry confirms a better structural stability than other sectors of the Made in Italy system also in terms of capital, as confirmed by the recent analysis of the sector's financial statements: economic and managerial values are highlighted which, on average better than other industrial sectors, allow us to face the economic political situation still very uncertain.

Channels

Considering the breakdown of turnover by distribution channel on the domestic market, we report the positive trends in direct sales, especially thanks to e-commerce, in balance with the contraction in door-to-door sales and correspondence, which together grow by 0.7% , while the other traditional channels,

[4] Up to 9 euros for particular lots, e.g. in Trentino.

[5] Beauty Report 2019 - Ninth report on the value of the cosmetic industry in Italy - 51st analysis of the sector and cosmetic consumption. Cosmetica Italia - National Association of Cosmetic Companies

Fatturato dell'industria cosmetica

Valori della produzione in milioni di euro	2017 Valore	2017 Var. %	2018 Valore	2018 Var. %
Fatturato in Italia	**6.544**	**1,7**	**6.598**	**0,9**
Fatturato generato nei canali tradizionali	**5.828**	**1,6**	**5.877**	**0,9**
• di cui in farmacia	910	2,0	910	0,0
• di cui in profumeria	1.183	-0,5	1.197	1,2
• di cui nella grande distribuzione e altri canali (*)	2.961	1,4	2.991	1,0
• di cui in vendita porta a porta, corrispondenza ed e-commerce	773	8,7	779	0,7
Fatturato generato nei canali professionali	**717**	**2,0**	**721**	**0,5**
• di cui saloni di bellezza	189	2,4	190	0,5
• di cui acconciatura	528	1,9	530	0,5
Esportazione (fatturato all'estero)	**4.615**	**7,1**	**4.792**	**3,8**
Fatturato globale settore cosmetico	**11.151**	**3,9**	**11.390**	**2,1**

(*) include Erboristerie e Monomarca

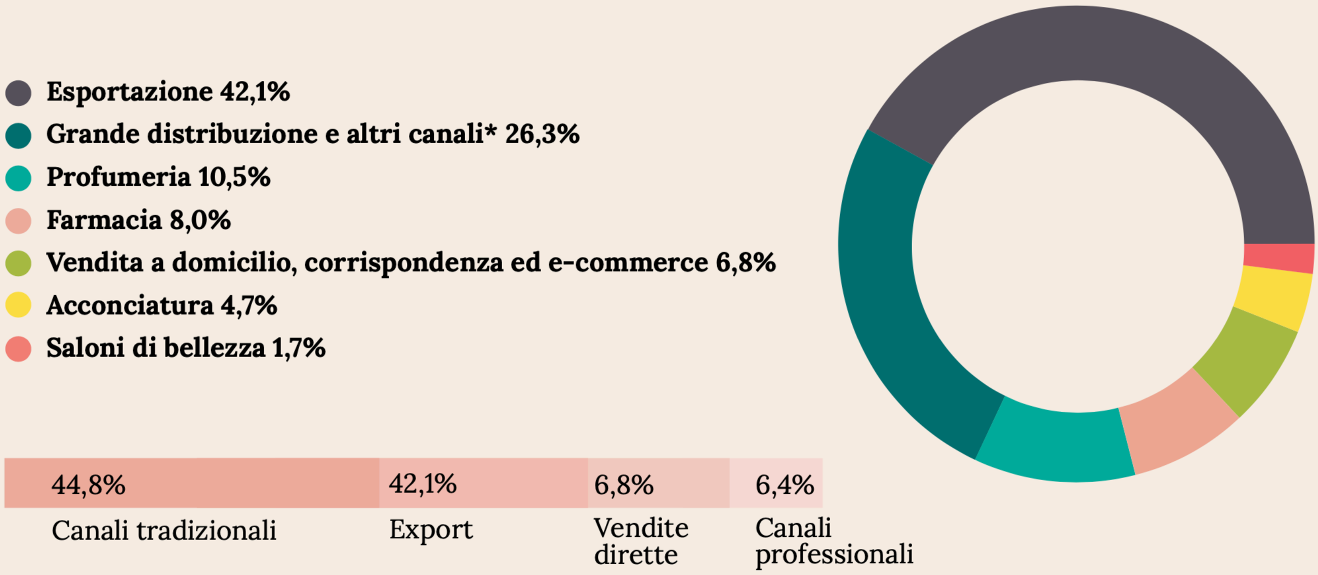
with the exception of the pharmacy, show satisfactory sell-in increases, + 0.9% for the value of 5,877 million euros, despite the changes in consumer trends.

In 2018, the recovery stabilized, + 0.5%, in visits to beauty salons and hairdressing salons, which most of all had suffered from the economic crisis that exploded in autumn 2008. Consistent with the trends of the last decade, on turnover of domestic companies still significantly affects the performance of exports which confirm the important recovery of profitability. Sales abroad, in fact, increased by 3.8%, for a value of 4,792 million euros.
If we analyze the percentage breakdown of turnover by destination channel, interesting developments can be observed: large-scale distribution still shows a slight contraction, going from 27% to 26.3% of the weight on turnover. Instead, the increase in exports continues, covering 42.1% of turnover, and direct sales (6.8%). While the weight of the pharmacy stabilizes, which today reaches 8% as well as perfumery, which confirms the 10.5% share while confirming itself as the backbone of the entire sector. The change in the competitive system in the cosmetic sector certainly also derives from the sudden shifts of consumers in the market which, moreover, has been marginally affected by the crisis, affirming for some time the cosmetic as a "physiological" consumer product and indifferent to negative conjunctures.

The negative effects of the crisis on purchasing propensities have been less felt than in other sectors, and this has generated changes in the choices within traditional channels, and at the same time the recovery in the attendance of professional channels is confirmed.
Also in 2018, the slow but steady recovery continues in all traditional channels, with the exception of the pharmacy and direct sales. Disaggregated from the latter category, the true phenomenon of recent years is confirmed vehemently, i.e. online sales, for which, given the difficulty of detection, the revision and adjustment of the statistical bases is underway, with dynamics in strong growth (+ 22%), for a value close to 390 million euros at the end of 2018.

Consumption in the herbal channel, although counted within the aggregate of large retailers, as well as the mono-brand, grew less than one percentage point.
Signs of growth, although considered in value, come from the perfume market, despite the transformations in the selective distribution methods. These transformations generate a constantly evolving gap: on the one hand, in fact, the reduction in number and weight on consumption of traditional perfumeries is observed, on the other the weight of specialized chains is affirmed, more attentive to customer service and new consumer needs.
Furthermore, in 2018 the absolute value of the professional channels was consolidated: consumption in

Ripartizione dei fatturati per canale di destinazione nel 2018



(*) include Erboristerie e Monomarca

the hairdressing and beauty salons in fact earn, for both, 0.5%.
Despite marginal changes in the cosmetic market scenario, some signs such as the evolution of new channels and the internal transformation of traditional sales channels cannot be overlooked. In fact, in Italy, as already happens in other countries with strong propensities to consume, consumers have acquired new spending approaches and new habits also in the pre-purchase knowledge mode.

Single channel focus.

Pharmacy

Sales of cosmetics in the pharmacy channel registered a flat trend, slightly decreasing in the second half of 2018, closing with a value of just under € 1,900 million. The cosmetics sold in the channel represent 18.3% of the total market, a share that has grown in the recent past, supported by the confidence that consumers recognize in the pharmacy, at its levels of specialization and care for the service. A share that seems to substantially undermine the second position that perfumery has held for over 50 years.

The dynamics of the channel follow the changing needs of consumers, the trust that they recognize in the pharmacy, at its levels of trust, specialization and care for accessory services, which however explain the general tightness of the channel and its potential, apparently still unexpressed.

Specifically, speaking of the product, and underlining the increasingly evident expansion of the categories of cosmetics sold, in 2018 solar products showed signs of suffering, balanced by the growth in sales of specific dermocosmetics.

Composizione percentuale delle vendite in parafarmacia

Pharmacies, in recent years, have strengthened their investment in the cosmetic product and in the specialization of sales staff, with more evidence than other traditional channels, to which must be added an increasingly close link between three companies and pharmacists who invest synergistically on identity pharmacy, positioning and customers. More than in other sales channels, numerous pharmacies strengthen the investment in the cosmetic product and in the specialization of sales staff, generating a new impact on promotions and offers.

The disaggregated surveys of the cosmetics sold in the corners of the GDO and in the parapharmacies help to understand how the distribution of the products destined for the pharmacy channel has evolved: just think that in 2008 these sales covered 5.6% of the total channel, while today they cover over 18% despite recent economic policy provisions.

Totale consumi al dettaglio di prodotti - canali tradizionali 2018

Prezzi al pubblico, I.V.A. inclusa - dati in milioni di euro

	Totale	Farmacia	Profumeria	Grande distr.ne e altri canali	**Var % totale**	Var % Farmacia	Var % Profumeria	Var % Altri canali
Totale	**8.465,1**	**1853,9**	**2036,9**	**4574,2**	**0,8**	**-0,4**	**1,5**	**1,0**
Prodotti per il viso	**1.455,5**	522,5	420,4	512,6	**2,0**	1,4	2,7	2,2
Prodotti per il corpo	**1.377,9**	445,5	128,1	804,2	**-1,2**	-1,8	-4,4	-0,3

The composition of sales, detailed by corners and parapharmacies on IQVIA data, highlights interesting features: in parapharmacies, sales of face and body products cover over 54% of sales, while in corners the composition is less concentrated, with products for the body (24.3%) which slightly precede the distribution of mouth hygiene products (20.8%) and those for the face (16.9%).

Perfumery

At the end of 2018, the perfumery channel recorded growth of 1.5%, significantly recovering after contraction exercises. The forecasts for the first half of 2019 also indicate a positive holding for one percentage point. At the end of the year, the total value of the channel was slightly over 2,000 million euros, which confirms perfumery in second place, after large-scale distribution, in the sales of cosmetics in Italy, around 20% of the total. It is precisely from the comparison with other channels that the importance of the mix of products distributed is noted: while in terms of weight, for example, large retailers reach 60% of value distributed with the first six products, perfumery covers the same share with two items, perfumes and face creams; the pharmacy covers a similar share with four different product families.
Despite supporting actions such as the new launches, the reduction of stocks and the dynamic list policies, the crisis of some independent stores continues, dilating the dichotomy between the static nature of many traditional / neighborhood perfumeries, and the success dynamics on the part both by organized chains and by some small distribution companies, good at highlighting the concepts of niche and exclusivity, with new distribution strategies and new investments in the selective identity of the channel. The transformation of the channel was evident, which in 1980 covered one third of all cosmetic consumption, while today, according to the historical surveys of the study center, it barely touches 20%. The analysis by type of product distributed also explains some structural constraints: with the first two products distributed, perfumes and face care, perfumeries reach 61% of all sales, while the pharmacy channel, which undermines the second position in distribution total, reaches 60% with face products, body products and body hygiene, demonstrating a better fragmentation of the offer.

Herbalist's shop

In 2018, the trend of consumption in herbalists shows a slowdown even if the trend values remain positive. The sales value, 441 million euros with a practically flat growth (+ 0.2%), however confirms the stability of the channel, which covers 4.3% of total consumption in Italy, thanks above all to the sales of the owner companies of specialized single-brand stores, as opposed to suffering in traditional herbalist shops.
More and more consumers are expressing interest in the world of "natural" and "green", fond of "naturally derived" cosmetics; this attention is distributed in other channels, where specific offerings are recognized. The value of this phenomenon, investigated in a specific survey, exceeds 1,100 million euros. Sales in herbalists, as well as those in pharmacies, confirm the selections of consumption by those groups of users who favor assisted and "recommended" sales, the reasons that push consumers to herbal medicine do not take into account neither the price nor the promotions , as proof of a well-rooted loyalty to the channel that must be experienced as an opportunity especially by traditional sales outlets.

Beauty centers

In 2018, the growth in consumption in beauty salons was 0.5%, for a value of 237 million euros, 2.3% of total consumption; a positive result even if contradictions emerge: In this context, in fact, the innovation efforts proposed by companies, attentive to the remodeling of distribution and to the new areas of treatment and well-being, and thanks to the attention paid to the new trends of increasingly demanding consumers regarding the quality of the service, those who practice it and the environment in which it is provided. Furthermore, some important emerging phenomena are increasingly evident, such as spas and wellness centers, which, dynamically, tend to cover increasingly large consumption quotas with an aesthetic / professional connotation. Not least the issue of professional training and updating of professionals which is necessary to satisfy the needs of customers.

I servizi proposti in salone

Fonte: Censimento degli Istituti di Bellezza, Marketing & Telematica (2019)

Servizi consolidati	
Trattamenti corpo manuali	99,0%
Trattamenti viso manuali	98,8%
Manicure	95,3%
Pedicure	95,3%

E-commerce

The e-commerce of cosmetic products was incorporated until a few quarters ago together with home sales and mail order, in the large aggregate of direct sales. The phenomenon has obviously become important to be considered independently: the growth at the end of 2018 is in fact 22 percentage points, which is associated with the forecast in development at similar rates also in the first part of 2019. The sales volume exceeds 390 million euros. Explanatory is the analysis of the penetration of the purchase deeds: the weight of the perfumes is interesting, but in general all the product families have an index higher than 15%, with the exception of products for oral hygiene, hand make-up, hairstyle and solar.

L'acquisto di prodotti di cosmetici online nel 2018: penetrazione degli atti d'acquisto e variazione rispetto all'anno precedente

Fonte: Human Highway, 2019

		Variazione punti percentuali rispetto al 2017
Profumi	17,2%	+ 1,9%
Prodotti per la cura del viso	16,9%	+ 1,8%
Prodotti per la cura dei capelli	16,6%	+ 3,2%
Prodotti per la cura del corpo	16,0%	+ 2,6%

The European scenario

As tradition, Cosmetics Europe, the European association representing the cosmetic industry, proposes the first statistical updates in 2018, pending the final data. The primacy of consumption in Germany is confirmed with over 13,800 million euros, followed by France with almost 11,400 million euros. Third place for the United Kingdom which, with a slower trend compared to last year, is close to the share of 10,900 million euros. Italy maintains the fourth position in terms of European consumption, followed by Spain, fifth, with 6,900 million euros and a positive trend, in line with last year's values. The concentration area confirms that the top 5 countries cover over 68% of the European market, which in 2018 reached a total of 79,000 million euros, recording a slight growth trend.

In the ranking of European cosmetics sales, products dedicated to skin care are in first place, 25.7% of the total, followed by toiletries. Europe is confirmed in first place in world consumption, followed by the United States (67,000), China (48,000), Japan (29,000) and Brazil with 23,000 million euros. This could translate into an already mature and ready market to welcome product innovations mainly thanks also to the sensitivity towards organic products and the circular economy; while it suggests large growth opportunities in emerging markets, especially in Asia and some areas of South America.

Composizione dei consumi europei per macrocategorie di cosmetici nel 2018

valori in milioni di euro - prezzi al pubblico

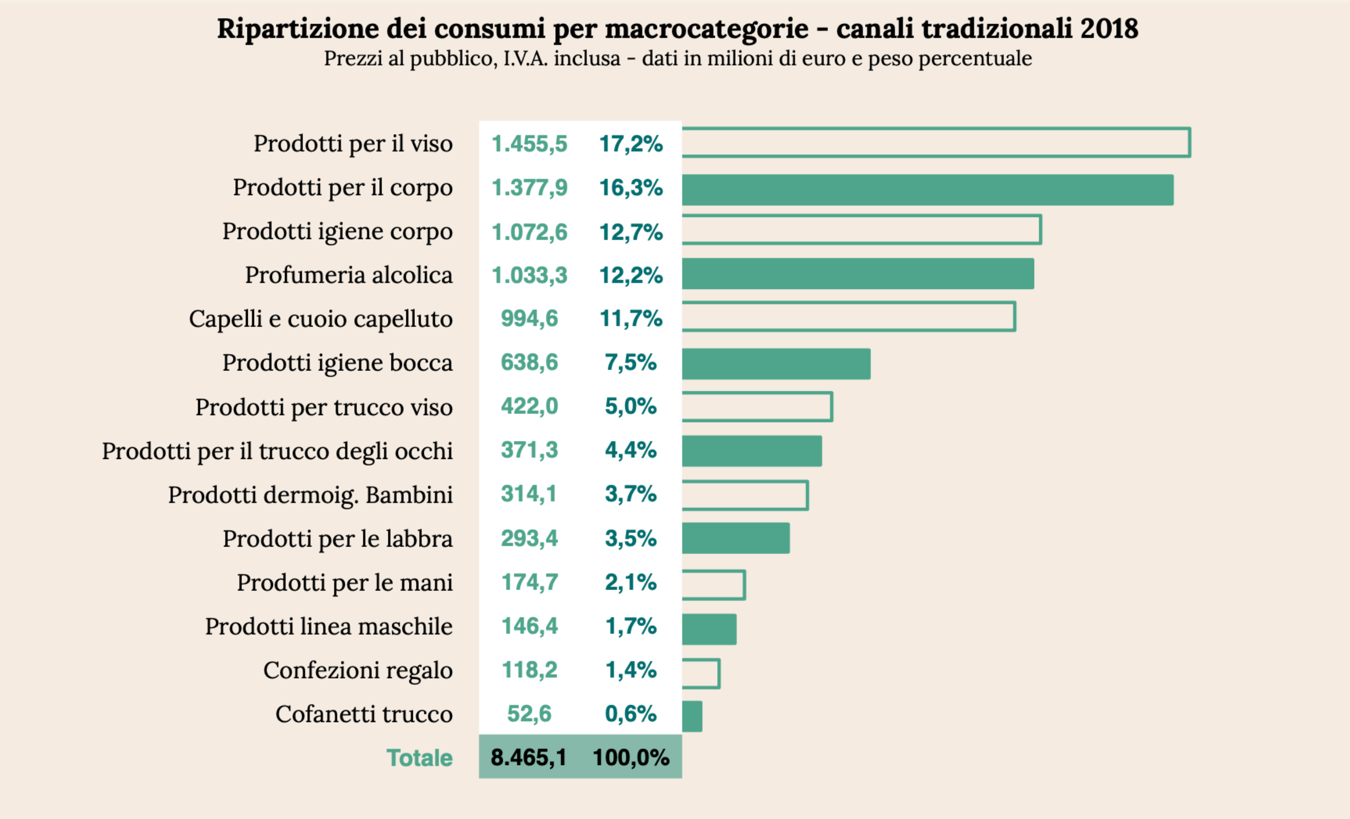
	Valore	Peso %
Cura viso e corpo	20.386	25,9%
Igiene personale	**19.920**	**25,4%**
Cura capelli	14.921	19,0%
Profumeria alcolica	**12.278**	**15,6%**
Trucco	11.069	14,1%
Totale	**78.577**	**100,0%**

Import - Export

For the sixth consecutive year, exports recorded a further substantial increase, with a value close to 4.8 billion euros. Italian cosmetics exported in fact reached 4,792 million euros, an increase of 3.8%. On the other hand, the final value of the data in quantity is almost "flat": growth is 0.1%, confirming that the push for internationalization is due to the appeal of Made in Italy abroad which allows expressing increases in the level of marginality. The consolidated recovery of foreign markets has a positive impact on the commercial balance of the cosmetic sector which confirms the trend that began in 1996, when the value of cosmetic exports exceeded that of imports. In 2018 the surplus was close to 2,800 million euros, well above many contiguous product categories, confirming Italian cosmetics as an active element for the country's economic system; the "new" destinations are increasingly affecting, strongly sought after in Italian business activities. The performance of the first value category of Italian cosmetic exports, creams and other products, grew by 7.2% with a value of 960 million euros. Europe is confirmed as the first outlet area for cosmetic exports with 3,103 million euros, thanks to the sustained demand from historically important countries such as France, Germany and the United Kingdom. The great growth of exports to the United States continues, + 20% for almost 500 million euros, as well as that of Hong Kong (+ 23.1%): the volumes of these countries are increasingly interesting, especially from a strategic point of view. the internationalization policies of companies in the sector. For some time there has been a homogeneous expansion of the export values of cosmetics from Italy: Asia, with a value of 874 million euros, the total value of Asian destinations, namely Hong Kong, China, South Korea, Malaysia and Indonesia, in fact, went from a total of 106 million euros in 2008 to 376 euros in the last financial year; an average annual increase of over 25 percentage points. Among the new world markets, exports of Italian cosmetics grow between 2017 and 2018, in India and Brazil, with a trend of + 22.8% and 25% respectively: although still in the presence of marginal values, it is a a sign that cosmetic companies are gaining internal market share in areas with a huge consumer base.

Focus on consumer trends

The closing values of 2018 show a positive trend in line with what happened in the last three years: cosmetic consumption in Italy shows positive notes with + 1.3%, reaching 10,152 million euros, comforting value if contextualized in the uncertainty scenario political and



economic. 2018 sees confirmed multi-channel purchasing behavior by consumers, one of the most evident characteristics of the Italian market.

Also for 2018, facial cosmetics are able to obtain, overall, a stable trend compared to last year, for a value of 1,456 million euros, the first ever as a family of consumer cosmetics in Italy. After the great performance that took place last year, the first family of value products is confirmed, that is, anti-aging and anti-wrinkle creams, in closing with a + 1.8% for almost 640 million euros, as well as moisturizing and nourishing creams (+ 1.6%), eye area and specific areas (+3.7 %). The trend of exfoliating masks is of considerable relevance and, by virtue of new beauty routine formulas that re-modulate their use, register an increase of over twenty percentage points leading to consumption close to 79 million euros.

The reading of facial products by channel shows a transversal growth in the pharmacy (+ 1.4%), perfumery (+ 2.7%) and large retailers (+ 2.2%) with fairly equidistributed consumption values, signal that this category probably represents a sort of lifesaver in category logic for the diversification of the shelf offer.

Prodotti per il viso

Prezzi al pubblico, I.V.A. inclusa - dati in milioni di euro

	Totale	Farmacia	Profumeria	Grande distr.ne e altri canali	**Var % totale**	Var % Farmacia	Var % Profumeria	Var % Altri canali
Totale	**1.455,5**	**522,5**	**420,4**	**512,6**	**2,0**	**1,4**	**2,7**	**2,2**
Creme antietà e antirughe (comprende in trattamento d'urto)	**638,3**	229,2	216,2	192,9	**1,8**	1,7	1,8	1,9
Creme idratanti e nutrienti	**257,0**	106,4	52,1	98,4	**1,6**	0,7	5,3	0,6
Detergenti e struccanti viso e occhi	**163,4**	49,2	35,8	78,4	**-1,3**	-0,9	-0,9	-1,7
Contorno occhi e zone specifiche	**142,7**	52,3	66,5	23,9	**3,7**	3,5	4,1	2,8
Maschere e esfolianti	**78,6**	14,1	23,2	41,2	**20,1**	24,6	8,6	26,1
Salviettine viso	**63,5**	3,0	4,9	55,6	**-0,6**	-3,8	2,1	-0,6
Prodotti per le impurità della pelle	**48,9**	43,9	3,7	1,2	**-3,8**	-2,9	-18,7	25,3
Lozioni tonificanti	**41,6**	6,2	18,1	17,3	**1,8**	-0,5	8,5	-3,7
Depigmentanti	**20,6**	17,1	-	3,6	**-4,0**	-2,7	-	-9,8

Trend and considerations

SUSTAINABILITY, STRADDLING BETWEEN PRODUCT AND PRODUCTION PROCESS

The green is a topic that has been overseen for many years by the cosmetic industry, it is transversal to the concept of both product and process and the Association, through a Working

Group started at the beginning of 2019, is developing its definition so as to promote monitoring, service and communication activities.

To date, the definition of "sustainability/green" linked to the cosmetic product, to which the Working Group is refining the terms of description, is as follows:

"It is a product that communicates elements related to environmental sustainability in terms of:

- *production processes (CO2 emission, water use reduction, waste management, energy saving, …)*
- *packaging characteristics (material reduction, recycled, recyclable, biodegradable packaging, …)*
- *supply chain management (raw material supply, transport, logistics and distribution …)*
- *environmental footprint (PEF, LCA, …)*
- *product certification (Ecolabel, Nordic Swan, Blue Angel)*
- *corporate certification (ISO 14001, B Corp, …)*
- *Other forms of environmental sustainability "*

In addition, the definition to refer to for a comparison on a global basis is given by Mintel, a research company capable of intercepting the new products placed on the market in 34 countries, thus identifying the trends, both emerging and more established:

"Products that lead, through graphics or text (label, sticker and claim), to product or production characteristics that provide environmental, social and economic benefits, protecting public health, are considered sustainable. The entire life cycle of the product is considered, from the extraction of raw materials to final distribution. "

Over the past three years, cosmetic products with "claims" related to sustainability have grown worldwide with an average rate of eleven percentage points, over 13,000 new references at the end of 2018, a sign of a strong interest, not only linked to the cosmetic sector , on which the offer is being oriented. Going into detail of the product categories, the evolution of the two-year period 2016-2018, highlights how the industry has focused more attention on the claim "sustainability" towards face and body care products (36% of the total worldwide launches of cosmetics of 2018 albeit in decline compared to the launches of 2016), followed by make-up, over 33% of the total launches, and hair products, 13% of the total launches, both growing compared to the previous two years.

Evoluzione del posizionamento del claim sostenibilità nei lanci mondiali di cosmetici

Elaborazione del Centro Studi e Cultura d'Impresa su database GNPD di Mintel. Distribuzione %

	2016	2018
Super Luxe	1%	1%
Luxe	3%	2%
Prestige	48%	54%
Masstige	17%	16%
Mass	21%	19%
Budget	11%	8%

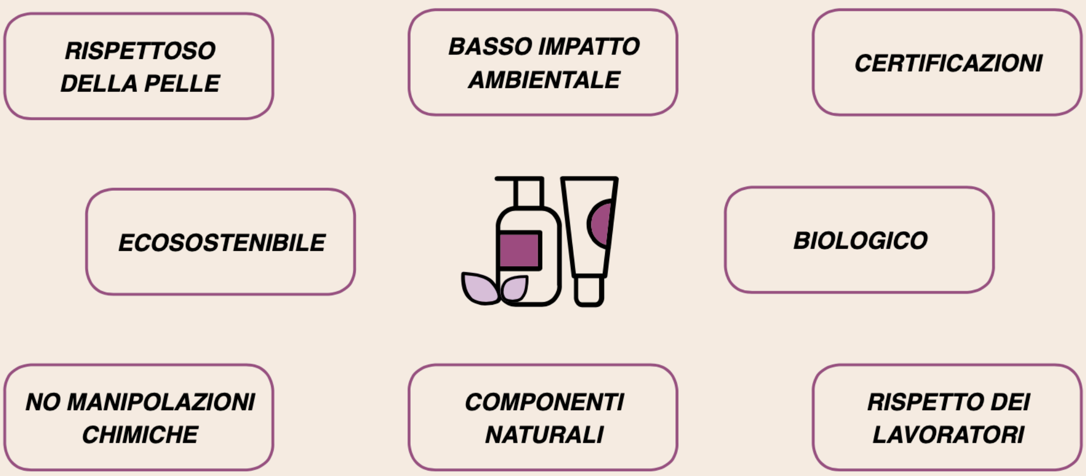
Building on the success of this claim, the positioning of cosmetics, understood as a price range, also changes.

Evoluzione del claim sostenibilità nei lanci mondiali di prodotti cosmetici
Elaborazione Centro Studi su database GNPD di Mintel. Numero di nuove referenze immesse sul mercato

	Numero di prodotti lanciati	Variazione rispetto all'anno precedente
2016	10.693	12,2%
2017	11.380	6,4%
2018	13.005	14,3%

The consumer, attentive and informed, is willing to pay more, knowing that the act of purchase not only enriches the affirmation of one's social status but contributes to the challenge of the industry in favor of all the issues surrounding the sustainable economy. Transversal themes to multiple stages of the supply chain and the production process.

Cosa intende il consumatore per cosmetico green
Fonte: Human Highway



Thanks to EY, among the world's leading companies in the field of sustainability analysis and consultancy, concrete actions are summarized on which to intervene, or remodel, along the production process, to provide environmental, social and economic benefits, protecting public health. However, the perception of the consumer is still weak, mixing areas related to the natural connotation of the cosmetic, with that of environmental impact and, unrelated to the classification of the green cosmetic, of product safety.

These findings are in line with what was stated in the "Mintel Report" (Global Beauty and Personal Care Trends 2030), which highlights some trends on the areas of greatest interest to consumers of cosmetic products in the next decade. Below is a summary of the trends considered to be of greatest interest for the purposes of this analysis.

Le azioni concrete dell'industria per fornire benefici ambientali, sociali ed economici
Fonte: EY

DESIGN
Sviluppare formule e prodotti innovativi che riducano il consumo di risorse naturali ed i relativi impatti ambientali diretti e indiretti sugli ecosistemi e sui cicli biogeochimici.

REPERIMENTO MATERIE PRIME
Implementare pratiche di approvvigionamento sostenibile, ossia includere criteri sociali e ambientali nella selezione dei fornitori.

PRODUZIONE
Ripensare i processi produttivi con l'introduzione di nuove tecnologie per ridurre il consumo di risorse naturali, le emissioni climalteranti e inquinanti, così da garantire i più elevati standard nel rispetto dei diritti umani e dei lavoratori.

DISTRIBUZIONE
Ottimizzare le attività di logistica in modo tale da mitigare le emissioni di gas ad effetto serra e garantire il rispetto dei diritti umani.

CONSUMATORE
Sensibilizzare e informare il consumatore finale rispetto alle tematiche di sostenibilità favorendo il consumo responsabile e promuovendo quindi la riduzione degli impatti connessi alla fase di utilizzo.

FINE CICLO DI VITA
Implementare i principi dell'economia circolare promuovendo il recupero e il riutilizzo delle risorse.

Science
Advances in software, hardware, apps and augmented reality herald the Fourth Industrial Revolution and significantly change the way consumers choose, buy and interact with products.
The "vegan" trend evolves into an understanding of biotechnology.
As the products grown in the laboratory continue to enter the market, the well-being of consumers increases with biotechnology.

Nature
Consumers rely more on their instincts and knowledge and the role of the "expert" is questioned.
Confidence is questioned regarding shared information and marketing tactics used by brands.
Clean beauty evolves as consumers do more research than ever when making product choices and brand transparency embraces the product lifecycle.

Products without waste
This will happen when the waste stream enters the product development pipeline in response to sustainability.

Natural high-tech ingredients
This will be fully embraced by customers who want both organic and sustainable production

"Hack Biology"
As attention shifts from adding to longevity, with emotional and mental health taking center stage, new cosmetics will become essential for social survival. As consumers look to nature and

technology to "hack" their biology in 2030, approaches to age management will evolve. The aging of the global population will set new standards for what it means to grow old and the conversation will pass from aging to longevity, passing from the external aspect to emotional and mental health. With the improvement of life expectancy, growth in the beauty sector will be accelerated and cosmetics will become an essential element for social survival.

Transparency
In 2030, the clean beauty industry will only be the beauty industry. Attention will be focused on transparency and an eco-ethical mission rather than on the fear of marketing. Success will be achieved by offering information, providing the full story and avoiding misunderstandings. This is essential for expanding consumer understanding of biotechnology and facilitating the dramatic change in the aging conversation.

Mistrust due to misunderstanding
La sfiducia nei confronti delle etichette "pulite" e "verdi" vedrà i consumatori scrutare gli elenchi degli ingredienti e mettere in dubbio l'efficacia del prodotto. La fiducia entra in gioco in grande stile sia per i consumatori che cercano risposte dalla scienza, sia per quelli che scelgono d'istinto

Finally, the "Mintel Report" indicates two fundamental traits that must inspire the products, and therefore the companies, that will want to be successful among consumers in the next decade:

Inspire fierce loyalty
It will become the norm for brands to offer customers not only a product, but a lifestyle, as well as connect them to the people, places and things that inspire them. Even up to studying the behavior outside the scenarios of using beauty.

Simplicity
The simplification act will evolve to include all aspects of beauty and personal care products, not just the list of ingredients. Product mixes, access to information, and the supply chain will need to be ready to meet the needs of an informed consumer.

The Italian nutraceutical industry

The word "nutraceutica" was coined by the doctor Stephan DeFelice in the early 80s combining the words "nutritious" and "pharmaceutical", it is commonly used to refer to "nutritional products that provide health and health benefits." The main associations category that offer data collection services, managerial and regulatory consultancy are:

- FederSalus: representation, research, protection and legislative promotion, training and communication services.

- ENA (European Nutraceutical Association): Scientific association founded in 2005 with the aim of promoting scientific discussion on the nutraceutical world, as well as making the results available to associates. The headquarters were recently moved from Basel to Parma, where EFSA is also based.

- EFSA (European Food Safety Authority): EFSA's scientific opinions are crucial for the nutraceutical industry, as they establish which health claims are scientifically proven and can be included on the packaging labels of nutraceutical products.

The manufacturers of nutraceutical products formulate both self-produced and third-party ingredients. While the pharmaceutical industry is mainly based on active pharmaceutical ingredients purchased from manufacturers of fine chemicals and active pharmaceutical ingredients (API - Active Pharmaceutical Ingredients), located mainly in Asia, the nutraceutical industry tends to collaborate with some suppliers that act more as co - producers instead of suppliers who have to undergo periodic checks and certifications.

Both the ingredient producers and the finished nutraceutical producers are part of the same industry, where the synergy and success of all commercial partners dominates and is a common interest of the partnerships that characterize the sector.

Industry by numbers[6]

A growing industry

The Italian nutraceutical industry is the largest in Europe, with a market share of 23% and revenues of € 3.3 billion in 2018, followed by Germany (market share of 13%), France (9%) and the United United (8%).

As defined by the European Nutraceutical Association, nutraceuticals "are nutritional products that offer health and health benefits, including disease prevention and treatment. Contrary to pharmaceuticals, however, they are not synthetic substances or chemicals. formulated for specific indications. These are products that contain nutrients (partially in concentrated form) and are mostly assigned to the category of food. Dietary supplements are a typical example of nutraceuticals, but also a 23% market share and 3,3 billion euros in 2018 miliardi nel 2018, followed by Germany (13% market share), France (9%) and the United Kingdom (8%).

Table 1. Top 10 nutraceuticals (and omega-3) sold in Italy between April 2017 and April 2018 in terms of value.

Product	Value (million €)
Probiotics	385.2
Mineral supplements	232.6
Tonics	179.2
Hypocholesterolemics based on monacolin	129.1
Multivitamin-Multimineral supplements	119.5
Intestinal function	106.3
Vitamins	103.1
Cough (suppressants, expectorants, etc.)	98.7
Joints (joint health, anti-arthritic etc.)	93.3
Sleep and calm (stress-reducing and sleep-inducing products, sedatives, etc.)	91.6
Antiacid, anti-heartburn and anti-acid reflux	88.6
Omega-3	39.6

Source: FederSalus with data from New Line Ricerche di Mercato and IRi, April 2018.

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A FederSalus study, sponsored by SINut (Italian Nutraceutical Society) recently found that in 82% of cases, doctors or pharmacists recommended products to Italian consumers, 57.3% of whom started using food supplements following those tips. In Italy, 32 million citizens use nutraceutical nutritional supplements, 18 million on a regular basis (daily or weekly). Surprisingly, most (62.8%) of dietary supplement users are aged between 35 and 64 - that is, they are of working age. When asked if the consumption of nutraceuticals had health effects, the overwhelming majority (74%) of Italian

[6] FederSalus - National Association of Health Products Manufacturers and Distributors

nutraceutical consumers replied that the positive health effects were evident. Only 1.7% of the sample complained of negative effects.

Reflecting the positive effects of nutraceutical products on prevention, 58.1% of Italian nutraceutical consumers had to enjoy good health. Between 2008, when revenues amounted to 1.3 billion euros and 2018, when turnover increased to 3.3 billion euros, the Italian nutraceutical market grew by a surprising 126%. To make a comparison, the overall expenditure of households in Italy in the same period decreased by 0.8%. The number of workers employed by industry (21,700) grew by 43.9% between 2014 and 2017 and the revenues of nutraceutical products exported from Italy rose to 600 million euros. Italian nutraceutical companies are generally more profitable than their equivalent small and medium-sized enterprises (SMEs). The return on equity (ROE) of 174 representative companies in 2017 was 18.4%, when the average ROE of Italian SMEs slightly exceeded 11%.
In 2017 about 1.33 billion euros of the total market of 3.2 billion euros are owned by Italian companies, 198 of which, at the end of 2018, joined a commercial organization (FederSalus) created in 1999 by 12 pioneering companies.

Investments also recorded a significant increase (approx. 11%), with research and development, plants and machinery, e-commerce technologies and training that represent 82% of the investments made.

Trend and considerations

Over the past decade, the global nutraceutical industry has experienced dramatic growth. Revenues of $ 231 billion in 2018 are expected to grow at a compound annual growth rate of 7.8% from 2018 to 2023. Growth in the Italian nutraceutical market, currently the largest in Europe, accompanied that of the rest of the world. The case of Italy, in which a large nutraceutical industry was created largely in addition to the existing pharmaceutical industry, offers three main guidelines to other countries (such as Brazil, where the industry is also growing at a fast pace) 36 willing to establish their nation's nutraceutical industry as a key industrial resource in their overall economy.

First, nutraceutical companies need to validate health claims with the results of clinical trials. Second, companies will increasingly adopt sustainable manufacturing and advanced packaging technologies typical of pharmaceutical products. An example is an Italian nutraceutical company (Kolinpharma) that uses a package of products with a tamper-proof packaging closure that shows evidence of an effective closure from the purchase of the product through tactile and chromatic.

However, what the Italian and European nutraceutical industry often faces is a situation similar to that of the general economy of the United States where a recent survey of 600 employers conducted by a renowned educational services company found that everywhere there It is a discrepancy between the skills that employers need and the training of students and employees with the majority of employers who claim that recent graduates are not well prepared for the job.

The third main guideline of this study, therefore, is to fill this gap requires the development of short-term practice-oriented courses through which graduates not prepared for the workplace can acquire the knowledge and skills necessary to excel in numerous jobs in the nutraceutical sector.

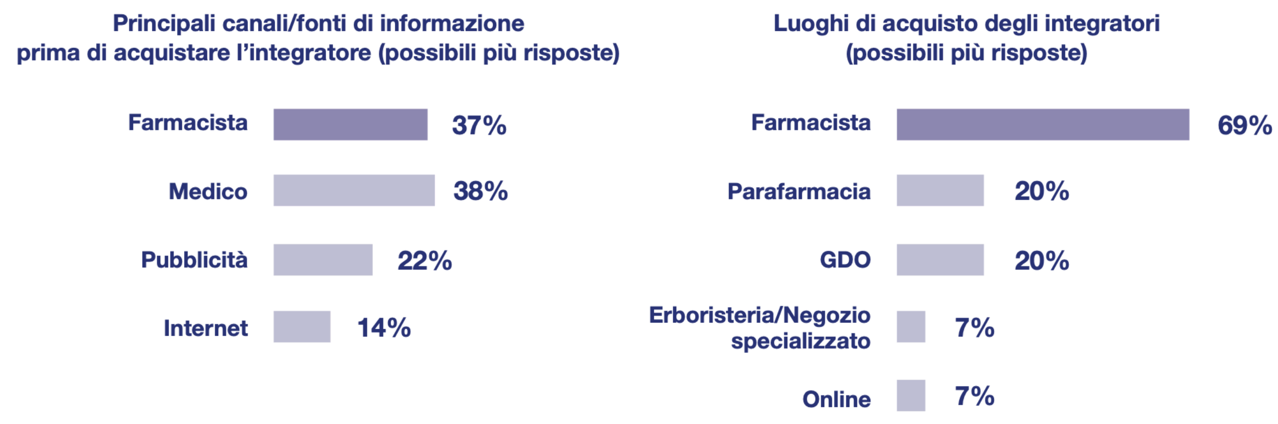
Finally, some indicative data of the behavior of Italian consumers are shown below, extrapolated from the "Position Paper" published in March 2018 (2017 data) by FederSalus. The data highlight the great importance of the role of doctors and pharmacists in recommending the use of food supplements to ensure a healthier viga style, treat certain psycho-physical ailments with products of natural origin and start a health prevention process. which is becoming an increasingly important aspect in consumer purchasing choices. These data, objectively, pick up and confirm the concepts and trends reported by the "Mintel Report" on the cosmetic sector:

- Informed and scrupulous customers

- Trust in exchange for scientifically validated information from qualified personnel
- Attention to Green and Sustainable production
- Interest in understanding bio-technological products
- Interest in natural products with high technological content

And they are therefore of great synergistic interest also in the nutraceutical sector, as well as for the purposes of this document. In particular, there is a strong convergence in the channel of pharmacies and parapharmacies, which are among the preferred channels following the scientific legitimation of the workforce, both in the nutraceutical sector, in the cosmeceutical and cosmetic sector.

The pharmacist is, in fact, one of the two reference figures for consumers of food supplements: 37% of consumers are recommended in the pharmacy and 38% by the doctor. A recent survey conducted by GfK shows that 69% of respondents buy food supplements in pharmacies. It is therefore very important to know and evaluate the critical issues that pharmacists may encounter in the management of the category of supplements. These critical issues can negatively affect the preferences / choices of consumers who rely on the pharmacist's expert advice for the purchase of food supplements.



Base: Consumatori di almeno 1 categoria di integratori alimentari nell'ultimo anno, valori % (32 milioni di italiani come da proiezione sul campione dei 6.946 intervistati)
Fonte: Gfk Food Supplements Monitor 2017 per FederSalus (6.946 intervistati)

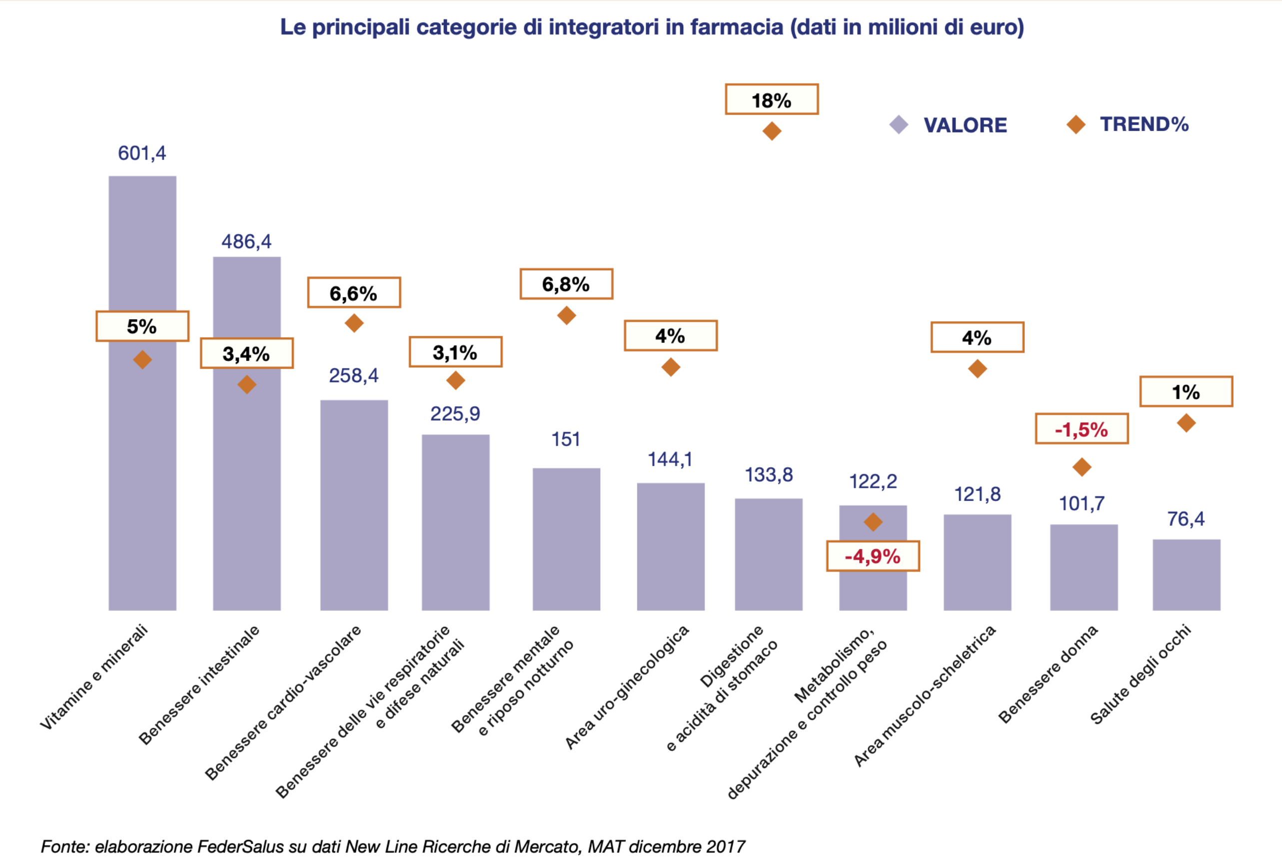
From an investigation conducted on pharmacists in 2016, an information requirement emerges with reference to food supplements: 26.4% of the pharmacists interviewed declared a lack of information on how to choose the right product for their customers, on possible side effects or interactions with other products and on easily identifiable objective quality indicators.

About 92% of the total value of the supplement market is generated in the pharmacy where they represent the second category for revenues after the ethical drug with a share of 10.6% of the total turnover of Italian pharmacies. In a general context in which the value of SNN recipes is decreasing, the number of pharmacies is growing slightly (CAGR + 0.7%) while their average turnover decreases (CAGR -1.2%), food supplements allow to support the margins of the sales point by helping to support its overall turnover, resulting in the category with the highest growth trend (+ 5.5% in the last year).

Food supplements are sold in pharmacies with an average value per pack of 15.7 euros, an increase of 2% compared to the previous year, this value drops to 13.8 euros if the global market for food supplements is taken into consideration. From Federfarma's report "The Italian pharmacy 2016", it can be seen that the average value of the NHS drugs sold in the pharmacy is equal to 9.6 euros, therefore supplements are a source of high potential revenues for the pharmacy.

The logics of the use of food supplements highlight a greater attention by consumers to the adoption of lifestyles, including food ones, more suitable for preserving their health. An increasingly evolved vision of health emerges among consumers, on which numerous individuals invest more in terms of commitment and best practices.

The supplement market can be divided into two categories: a traditional and consolidated market in use that responds to a tone support and energy reinforcement logic and a more innovative and evolving market that responds to more complex needs such as "disturbances" specific (eg intestinal and urinary tract "disorders") and a logic of "prevention" (eg cardiovascular, bones, joints). Consumers are divided equally between the two categories: 50% said they use dietary supplements for tone support and energy reinforcement (35%) and for well-being (15%) while the other half use them in specific situations (28%) or with a view to "prevention" (22%). Within the pharmacy offer dynamics, food supplements allow to support the margins of the store and to respond to new health needs in a "preventive" way of customers.



It is important to note that there are opportunities for pharmacies in managing the category of food supplements. In this regard, a recent analysis conducted by New Line Ricerche di Mercato analyzes the growth potential of the turnover of Italian pharmacies relating to the food supplements sector. The analysis shows that pharmacies with higher development potential have a food supplement turnover of almost three times that of the average pharmacy, which has an estimated potential turnover of around 148,000 euros. The development possibilities appear more accentuated in the pharmacies located in Central and Southern Italy, where the consumption of supplements is less consolidated than in the Northern area of the country.

Finally, it is essential to highlight that the dynamics of the Italian market, which maintains a leading position in the European market, reflect a dynamic and healthy production structure.

Italian Regulatory framework for food supplements[7]

In agreement with art. 2 of Directive 2002/46 / EC, food supplements are "food products intended to supplement the common diet and which constitute a concentrated source of nutrients, such as vitamins and minerals, or of other substances having a nutritional or physiological effect." In Italy the reference standard for food supplements is Legislative Decree no. 169 of 21 May 2004 which implements the aforementioned Directive 2002/46 / EC for the approximation of the laws of the Member States relating to food supplements.

The placing on the market of food supplements is subject to the notification procedure of the label to the Ministry of Health which may request changes to protect the health and safety of the consumer or, in the most extreme cases, may require the withdrawal from the market of the product. If this procedure is successfully concluded, the products are entered, with a specific code, the details of which can be reported on the label, in the Register of Food Supplements periodically updated and published on the website of the Ministry of Health.

Specific guidelines of the Ministry of Health contain provisions applicable to individual classes of substances that can make up food supplements, such as the maximum levels of intake allowed with reference to vitamins and minerals.

With particular reference to botanical products, the list of plant extracts that can be used in supplements is available on the website of the Ministry of Health, for some of which there are specific warnings to be reported on the label. Two lists of allowed plants are available: a) the Italian list with the indications of reference for the physiological effects defined by the ministerial guidelines; b) the BELFRIT list, which is a common list of plant substances and preparations ("botanicals") defined by the competent Authorities of Belgium, France and Italy on the basis of a review of the national lists according to the available scientific evidence. It should also be noted that, in order to be used in a food supplement, a substance must have recorded significant prior consumption in the EU, prior to May 1997, as a safety test. If this condition does not occur, the substance is configured as a new ingredient, so-called "Novel food", or a new food product pursuant to European Regulation no. 2015/2283 and, therefore, any use even in the food supplement sector alone requires prior authorization at Community level.

The European Regulation n. 1924/2006 relating to nutrition and health claims made on food products. Nutritional indication is defined as any indication that states, suggests or implies that a food has particular beneficial properties, due to: a) the energy (caloric value) it brings, provides at a reduced or increased rate, or does not provide; b) to nutrients or other substances it contains, contains in reduced or increased proportions, or does not contain.

Stakeholder Analysis

As anticipated, this section will welcome an analysis of the stakeholders (those known at the time of writing this document) of a potential startup that wants to position itself in the cosmetic / nutraceutical market through products deriving from the use, as raw materials, of the by-products of grape and wine processing.

The analysis goes into detail of each identified actor, regardless of its relevance and degree of potential influence, briefly describing its nature and activity. Subsequently, this "list" will then be visually distributed on a "Stakeholder Map" based on the degree of influence that each actor could potentially

[7] Position Paper - The role of food supplements in the pharmacy (March 2018) - FederSalus

exert on the startup. For this analysis, three degrees of influence have been identified that correspond to as many categories:

- CORE STAKEHOLDERS
- DIRECT STAKEHOLDERS
- INDIRECT STAKEHOLDERS
- MARGINAL STAKEHOLDERS

“Core stakeholders”

Wine producers and distilleries

Some of the most important players obviously reside in the wine sector, differently distributed along its wide, articulated and uneven supply chain. It goes without saying that having a clear picture of the dynamics of the entire sector is vital for identifying trends in consumption, production and therefore also in the dynamics of use and / or disposal of by-products. Among them, the large producers certainly fall into the "core" category, as they possess volumes, resources and know-how such as to be able to invest in machinery, technologies and processes. To name a few:

- Antinori
- Gruppo Santa Margherita
- Zonin
- Masi
- Caviro

These types of actors are important as they are at the cutting edge of technology and possess product and process know-how and can play a fundamental role if inserted in a perspective of financing in research and development of alternative disposal processes for their waste of production.

The same degree of relevance is assumed by distilleries. Although the raw material of interest of a potential startup in the area indicated above is wine processing waste, distilleries (and not wineries) are the main entities responsible (by law) for the disposal of such waste, also providing a very important contribution in guaranteeing the characteristics of circularity (increasingly important for institutions and consumers) to the wine sector. In them therefore resides the highest degree of know-how on the raw material in question and therefore, probably, the best technologies and the best plants. In particular, the characteristics of some products (such as Grappa) require processes such as the separation of the grape seeds from the grape marc, which could be of great interest to potential companies wishing to specialize in the production of certain cosmetic and nutraceutical products.

Wine sector associations

Furthermore, relations with trade associations are to be considered of great importance and strategic importance. These associations represent fundamental discussion tables attended by the main players in the supply chain, as well as organizations promoting development projects and constantly improving the processes and dynamics that regulate the sector. This considered, from the analysis carried out for the composition of this document, an association of particular relevance for the purpose of this work emerged: INNUVA. The same "mission statement" (INNUVA wants to encourage the birth of new businesses or develop new business lines of existing companies, conveying new collaborations and collaborations between entrepreneurial realities, public administration and university environment) highlights the will of the association to act as a discussion platform for the development of new projects and products by companies (existing or newly established) interested in collaborating for the exploitation of wine-making by-products, with particular attention to issues and principles of Circular Economy[8].

Sebbene ai fini di quest'analisi, l'ecosistema di partner e attori in cui tale associazione opera verranno considerati e posizionati (soprattutto a livello visivo) sotto un unico cappello facente riferimento all'associazione, di seguito, verranno elencati e brevemente descritti i suoi principali partner.

INNUVA Partners & Projects[9]

- **Poliphenolia:** Cosmeceutical company born in 2016. It produces face creams through the study and use of polyphenols extracted from grape marc selected from the local vines. They strongly believe that a new circular economy can be created by combining tradition and innovation.
- **NobilBio Ricerche:** Biomedical company among the first supporters of INNUVA. He has concentrated the research and development of the last 5 years on the application of polyphenolic molecules extracted from pomace in the medical sector.
- **F.lli Durando:** In Portacomaro, in the heart of Monferrato, the F.lli Durando agricultural family produces hazelnuts, wine, eggs and other delights of the area to which it has always been linked, offering an authentic experience in contact with nature. A story that dates back to the 1800s of the Durando company and which through tradition and innovation has come down to the present day. In 2008 the family chose to devote themselves to the production of Piedmont IGP hazelnuts; in 2013, thanks to the introduction of a 19th century stone mill, flour production began; in 2016, it opens the doors of the Terra d'Italia farmhouse and in 2018 the laboratory for the transformation of Piedmont hazelnuts PGI. A lively company, constantly evolving but firmly linked to the territory. Always active on the concepts of sustainable economy; it was the first to believe in the INNUVA project, and to make itself available to partner companies to develop sustainability projects.
- **Glerage:** Glerage was born from the passion for its territory, the Prosecco Hills today Unesco heritage. GLERAGE developed a project discovering that nature had placed an unexplored richness inside the golden grains of the Glera grape. Thus Anima d'Uva was born, the first serum-cream that uses polyphenols extracted from the seeds and skins of the Glera grape. Anima d'Uva di Glerage is the result of a project that was born with the desire to create a product from the surrounding environment and that represents its territory in an authoritative and sustainable way, drawing from it the essential elements so that the product itself enhances it and preserve its authenticity.
- **UniASTISS:** The University has a central role for INNUVA's activity, since it is the place where the professionals of the future are trained. The university hosts the formal headquarters of the INNUVA association, and supports the association through the organization of events and workshops on the circular economy.
- **Greenstep:** Cosmeceutical company born in 2016. It produces face creams through the study and use of polyphenols extracted from grape marc selected from the local vines. He strongly believes that a new circular economy can be created by combining tradition and innovation.
- **USEMED:** Use-Me-D srl founded by Eng. Ravizza in 2018 is an innovative startup located at the I3P (incubator for innovative companies) of the Turin Polytechnic. The company deals with consultancy support at the level of management of the Quality, Regulatory and Usability system of medical devices. Use-Me-D is also able to offer Project Management support that helps the

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[8] According to the Ellen MacArthur Foundation's definition of the circular economy "it is a generic term to define an economy designed to be able to regenerate itself. In a circular economy the flows of materials are of two types: biological ones, capable of being reintegrated into the biosphere, and technical ones, destined to be re-valued without entering the biosphere ". The circular economy is therefore an economic system planned for reuse materials in subsequent production cycles, minimizing waste. - economiacircolare.com

[9] https://www.associazioneinnuva.it/chi_siamo/partners/

end customer to better manage the cost and time aspect of the project. We mainly turn to manufacturers of medical devices and healthcare professionals who are willing to develop and bring an innovative and complex medical device from the point of view of human-machine interaction to achieve CE certification..

- **Sarotto Group:** Sarotto Group was born in the early sixties as a construction company and over time it specialized in the prefabrication, construction trade and green building sectors. The company is equipped with photovoltaic solar panels for its autonomous livelihood and has two patented innovations on its curriculum: a prefabricated house "with almost zero consumption" (Biocasa®) and an anti-seismic and ecological (Klimasismic) construction system. Sarotto Group is a small company with great objectives, which designs and builds energy-efficient buildings and carries out, in collaboration with other companies and universities, research paths devoted to the development of a sustainable economy for the environment. From production to the final product, each activity of the Sarotto Group is optimized to minimize the use of fossil sources: the plants and machinery such as electric trolleys, gantries and heat pumps are powered with entirely self-produced energy; the buildings built are self-sufficient and with very low consumption.

Legislator

Although the purpose of this document is not intended to provide an interpretation and a detailed analysis of the reference regulatory framework, the main sections of the legislation regarding the disposal of wine-making by-products, as well as that concerning the classification of the nutraceutical products. Given the nature of the typology of products identified as strategic by the BESTMEDGRAPE project, the regulatory issue is more important than ever. Any product created and developed in the cosmetic or nutraceutical sector has a potential direct impact on the well-being or health of the end consumer and is therefore subject to various test phases, as well as to specific legal regulations in terms of legitimacy, compliance and marketability. . Monitoring of regulatory matters and assistance for correct and efficient navigation within its banks are undoubtedly an element of fundamental importance and a sine qua non condition for starting any business project.

EFSA[10]

EFSA provides specialist advice to enable the European Commission, the European Parliament and the EU Member States to make effective and timely decisions on risk management, thanks to which the protection of the health of European consumers and safety is ensured of food and the food chain.
The Authority communicates with the public in an open and transparent way on all matters falling within its sphere of competence. EFSA's scientific activities are used by political decision-making authorities to adopt or review European legislation on food and feed safety, to decide on the approval of regulated substances, such as plant protection products and food additives, or to introduce new regulatory frameworks and formulate new policies, for example in the nutrition sector.
EFSA has already issued scientific opinions on a wide range of risk-related issues. These include: bovine spongiform encephalopathy (BSE) and transmissible spongiform encephalopathies (TSE), the safety of food additives such as aspartame, allergenic food ingredients, genetically modified organisms (GMOs), farmed or wild fish, pesticides and veterinary health issues such as bird flu.
In addition, EFSA takes on work assignments of its own initiative in scientific fields, such as emerging risks, in which knowledge and approaches are constantly evolving. An example of this activity is the development of a harmonized approach to compare the risks of potentially carcinogenic substances.
The Authority collects and analyzes scientific data to ensure that risk assessment at Community level takes place on the basis of absolutely complete scientific information. EFSA does this in collaboration with EU Member States as well as through public consultations and invitations to collect information from external sources.

[10] Source: Wikipedia

Finally, through its risk communication actions, EFSA provides coherent, accurate and timely information on food safety issues to all interested parties and to the general public, based on the risk assessments carried out by the Authority and its scientific experience.

"Customers and Competitors"

Given the still embryonic state of the "Business Creation" activities envisaged by the project, the detailed analysis of these types of stakeholders appears to be irrelevant, especially due to the specificity that each of the startups emerging from the business creation activities will possess in terms of strategy , operation and positioning. However, it seems useful to mention that from the point of view of potential customers, there are numerous windows to be able to be inserted within both the wine supply chain, such as in the cosmetic and nutraceutical sectors, both in a B2C and B2B perspective. Similar discussion can be made with reference to the competitive scenario.

It may also be useful to point out some entrepreneurial realities that have been pioneers in the specific field of reuse of by-products from winemaking or at least from vitis vinifera or grape extracts. In the cosmetic field, the best known and international B2C brand is undoubtedly Caudalie. However, the most direct competitors are found in the nutraceutical (B2B and B2C) or cosmetic (B2B) sectors:

- Aboca
- ErbaVita
- NGN Healthcare – New Generation Nutraceuticals (Prodotti Fluxovas e Fluxogene)
- ArkoPharma
- Pureclinica

Finally, it may be of particular use to know the main suppliers of raw materials for the pharmaceutical, nutraceutical and cosmetic industries such as[11]:

- Farmalabor
- A.C.E.F. SPA - AZIENDA CHIMICA E FARMACEUTICA
- AGER Srl
- AL.MA COSMETICS Soc. Coop. Arl
- ALSA LAB Sas
- ANCOROTTI COSMETICS Srl
- ARDES Srl
- AREADERMA Srl
- BIO BASIC EUROPE Srl
- BIO FARMA Spa
- CARLO FIORENTINI Laboratori Srl
- COSMETEC SRL
- COSMOPROJECT SPA.

[11] *"Who's Who - The names, profiles and faces of Italian cosmetic excellence - 2019 Edition "- Cosmetica Italia*

For the complete list, refer to "Who's Who - The names, profiles and faces of Italian cosmetic excellence - 2019 Edition" - Cosmetica Italia.

"Direct Stakeholders"

Standardization Institutions (ISO)

Turning to the category of direct stakeholders, immediately after compliance from a regulatory point of view, reliability and legitimacy regarding quality and sustainability requirements appears of great importance. For this reason, the need to adapt to international standards ISO (International Organization for Standardization) is a major element. In particular, of great importance are:

- ISO 9001:2015 - Quality Management Systems
- ISO 14001:2015 - Environmental Management Systems
- ISO 22000:2018 - Food Safety Management (as regards the nutraceutical sector).
- ISO 27716:2007 - Certification of good manufacture of cosmetics

Certification Institutions

Further legitimization in the eyes of the entire production ecosystem and the market can be obtained if following application and compliance with the ISO standards listed above, it was decided to certify these processes through accredited realities. There are several accredited centers for certification; one of these is TÜV Sud - Italy. The certification of the international standards referred to above certainly responds to a request for quality and legitimacy from customers, be they B2B or B2C, increasingly informed and "demanding" as regards the quality and sustainability of products and services. However, it represents at the same time a real strategic asset capable of opening up new market and business opportunities for the certified company. With this in mind, we point out two further certifications that respond to both needs:

- EcoCert: international organization that provides certifications in the agri-food, forestry, textile and cosmetic fields. (https://www.ecocert.com/en/home)
- BCorp: The "BCorp" certified companies are companies that meet the highest standards of verified social and environmental benefits, public transparency and legal responsibility to balance profit and purpose. (https://bcorporation.net)

Category Associations Nutraceutical / Cosmetic sector

As for the wine sector, also in the nutraceutical and cosmetic sector, the trade associations take on a very high degree of importance, for their role as glue between the various players in the chain, for their ability to collect, analyze and disseminate the main sector data and trends, as well as for the weight and representation at the institutions. Below are some of the main trade associations for both sectors.

Cosmetic

Cosmetica Italia: Cosmetica Italia was born to support the development of cosmetic companies in Italy, today it is a well-structured association - the largest in Europe - and offers services, representation and protection to the 500 associated companies. Since 2008 it has established the quality management system according to UNI EN ISO 9001: 2008 and in 2013 the UNI EN ISO 14.001: 2004 environmental management system, both obtained from Certiquality. Cosmetica Italia now has over 500 companies, representing 95% of the sector's turnover. The range of services and functions performed by the study and corporate culture center, technical-regulatory area, international relations and activities area, administrative area, press and communication office area that make up the structure of Cosmetica Italia alongside the traditional product groups are wide: cosmetics in perfumery, cosmetics in pharmacy, cosmetics in herbal medicine, professional products for hairdressers, cosmetics for aesthetics, production for third parties and Accademia del Profumo. Institutional activities, calibrated respecting the dimensional and structural heterogeneity of Italian companies, are accompanied by a communication plan aimed at increasing the reputation and knowledge of the sector also thanks to the annual appointment with the presentation to the political and institutional world of the Beauty Report. The editorial and promotional projects signed by Cosmetica Italia add up to the trade fairs sponsored in Italy and worldwide: Cosmoprof Bologna, Cosmoprof Asia in Hong Kong and Cosmoprof North America in Las Vegas. Cosmetica Italia also thinks about social issues in sponsoring the association La Forza e il Sorriso - L.G.F.B. Italy, engaged in the creation of free beauty laboratories for women in cancer treatment following the example of the international project Look Good ... Feel Better.

Cosmos: COSMOS standard is managed by the international, independent and non-profit association, the COSMOS AISBL standard based in Brussels. The founding members (BDIH - Germany, Cosmebio - France, Ecocert - France, ICEA - Italy and Soil Association - United Kingdom) manage the COSMOS standard and provide their continuous development with their competence. COSMOS establishes the criteria for the COSMOS standard and authorizes approved certification partners for the certification of retail products and ingredients. We have 10 authorized certification partners in Europe, Australia and Asia that offer COSMOS certification worldwide.

Nutraceutical

European Nutraceutical Association: scientific association founded in 2005 with the aim of promoting scientific discussion on the nutraceutical world, as well as making the results available to associates. The headquarters were recently moved from Basel to Parma, where EFSA is also based.

Fedesalus: legislative representation, research, protection and promotion services, training and communication. To achieve its goals, the Association is committed to:

- foster the reputation of the sector and promote education and awareness of product quality;
- support a harmonized regulatory framework, consistent and appropriate to the specificity of the food supplement;
- support the scientific substantiation of health claims;
- promoting the quality of products marketed by companies in the sector to protect the consumer;
- encourage the rational and correct use of food supplements.

Federfarma: Federfarma is the national Federation which represents the over 16,000 private pharmacies affiliated with the National Health Service. Born in 1969, Federfarma includes the Sunifar (Unified Union of Rural Pharmacists), which represents rural pharmacies with their own specific features..

Indirect Stakeholders

Alternative use competitors

Although it is of little use to carry out a detailed analysis of the competitive scenario in the absence of a specific reality with a well-defined business model and strategy, it is instead useful here to give a first idea of the application areas of the derivatives from by-products of winemaking and of the cases most successful identified following this analysis. Some of them have already been mentioned previously as they are part of the INNUVA ecosystem (Poliphenolia, Greenstep, Sarotto Group); Instead, some projects that have met with particular success will be listed and briefly described below, albeit in areas other than the cosmetic or nutraceutical sector. Most of these projects have been developed in collaboration with university research centers, but we will conclude with a very successful project, the result of a private initiative, and which has already obtained important international awards, including the Global Change Award.

Universities and Research Centers

- **<u>Project ValorVitis e ValorVitis2.0:</u>** Sustainably reuse the by-products of winemaking (skins, stalks, seeds) to obtain flour and oils that are good for health, to be used in the food, pharmaceutical and cosmetic fields. This is the purpose of ValorVitis 2.0, which thanks to the results obtained with the Ager project "Enhancement of by-products of the wine supply chain for the production of compounds with high added value", aims to promote the recovery of winemaking residues, in particular by promoting the production of grape skins and expanding the range of food applications. The recovery of by-products is a current topic in all countries with intense wine production, where foods with added compounds extracted from the marc begin to appear on the market. ValorVitis 2.0 has the objective of developing a strategy for the valorisation of grape processing by-products at national level to the benefit of the entire wine sector and consumers.

  Partner: Università Cattolica del Sacro Cuore (capofila), Università degli Studi di Milano, Università degli Studi di Torino, Università degli Studi di Scienze Gastronomiche di Pollenzo (Cn), Università degli Studi di Trento

  Info: Prof.ssa Giorgia Spigno, scientific manager, Università Cattolica del Sacro Cuore

- **Project Vis Maris:** the project saw the collaboration between Farmalabor and the University of Bari "Aldo Moro". The research activity, coordinated by Prof. Jirillo (Faculty of Medicine - Bari), made use of the participation of the research group of Prof. Gesualdo (Faculty of Medicine - Bari) and Prof. Centoducati (Aquaculture, Faculty of Veterinary and Agraria - Bari). The aim of the project was to improve fish welfare and that of end consumers. The activity involved the enrichment of traditional feed with the phytocomplex extracted from small berry trojan grapes (the result of research carried out at the "Sergio Fontana, 1900 - 1982" Research Center) with the aim of strengthening the immune system of fish by limiting the use of antibiotics and / or vaccines and improving the quality of fish food on our tables. The results of this collaboration were so good as to lead a multinational company in the sector to sign an agreement at European level with Farmalabor for the production of a feed enriched with grape seed extracts.

- **Project UvaPretiosa:** As part of the European partnership for innovation and the Rural Development Plan of the Tuscany Region (measures activated (16.2, 1.1, 1.2, 1.3)), the Uva Pretiosa project intends to address the issues of reuse and enhancement of the by-products of the vine sector -enological in a circular economy perspective. The project will last 32 months - from February 2019 to October 2021 and the EAFRD contribution requested is € 315,255.57

- **BIOVALE - Biorefinery: added value of wine by-products:** Reuse the pomace, a by-product of the wine industry, extracting compounds with high added value thanks to economically and environmentally sustainable technologies. From this result already obtained with the Ager project "Enhancement of by-products and winemaking residues through extraction and production of high added value molecules" BIOVALE was born, with the aim of introducing and developing an innovative "biorefinery" model in Italy. From the marc it is now possible to extract compounds and molecules that can be used in the food, pharmaceutical, cosmetic sectors and produce bioplastics and bioenergy. BIOVALE wants to demonstrate the economy and convenience of extracting these compounds from the marc through carbon dioxide in the supercritical state (ScCO2), a green technology that does not require the use of organic solvents and allows to obtain extracts of high purity. Furthermore, it aims to recover electricity from wine fermentation residues (lees) thanks to a new technology (MFC / MEC) developed by researchers for the wine sector, which could also be applied to other by-products of agri-food processing, like the waters used in the pressing of olives

Partner: Università degli Studi di Udine (leader), Università degli Studi di Roma "Tor Vergata", Università degli Studi di Bologna

Info: Prof.ssa Carla Da Porto, Scientific manager, Università degli Studi di Udine

VEGEA COMPANY

Using winemaking waste, Vegea creates completely vegetable leathers. From an intuition of the architect Gianpiero Tessitore, who realized that the fashion industry cannot yet offer a truly green alternative to animal and synthetic skin, after three years of research Vegera was born, which uses the skins , the stems and seeds of grapes discarded during the production of wine for the production of 100% vegetable skins. No toxic solvents, heavy metals or hazardous substances are needed in the production process.

Vegea won the "Global Change Award", a € 300,000 loan with which the company was able to work on the first prototypes of grape skin clothes, bags and shoes. Winners of the Horizon 2020 award, the European Parliament also recognized Vegea as one of the best European start-ups of the new millennium. Vegea is still investing in research and development to further improve the material and make it compatible not only with fashion and packaging, but also for the furniture and auto industry. A partnership with Bentley was also announced in July 2019, which has chosen Vegea for the interior of its new car model.

"Marginal Stakeholders"

Fairs and Events Organizers

Always in ties with the trade associations, in addition to fairs and specific events on technological and innovation issues, international sector events are certainly an important showcase. Among these, undoubtedly stand out "Vinitaly", the international exhibition of wines and spirits for the wine sector and "Cosmoprof", for the cosmetic sector

Stakeholder Map