

The most common interventions include maintaining the animal outdoors for part or all of its life cycle, the offer of environmental enrichment and maintaining a farming density less than the legal limits. Another case is constituted by the supply policy of manufacturers or the MMR,

according to which suppliers are only accepted whose products fulfil certain criteria of well-being: for example, the choice of some distributors and processing companies only use eggs from free-range hens.

MANUAL FOR THE WELFARE EVALUATION OF THE IZS CATTLE FARM OF BRESCIA

The “Manual for the welfare assessment and bio safety in breeding cattle for meat”, prepared by the National Reference Centre for Animal Welfare (CRENBA) and published by the Livestock Institute of Lombardy and Emilia Romagna, addresses the need for creating a balanced and objective assessment system, easy to apply, that also allows comparisons between different farms on the basis of the measurements themselves, ensuring greater objectivity of the assessment provided.

According to the developed methodology, the evaluation of the welfare level of a farm includes both aspects relating to the structures and management (evaluated through the so-called “non-animal based measures” - N-ABMS), and those linked to the animals’ reactions to their living conditions (measured through the “animal-based measures” - ABMS).

The choice of the aspects to be evaluated fell on those easily measurable by objective surveys in almost all the Italian beef cattle farms. The ultimate goal is to compare the different farms on the basis of these assessments, ensuring a greater objectivity to the assessment provided. The assessment on farm animal welfare and bio-security is done through a checklist consisting of 56 items, divided into 5 areas: corporate and personal management; facilities and equipment; animal based measures (ABMs); bio-security; great risks and alarm systems. The result of the evaluations is a numerical value expressed on a scale from 0 to 100, capable of identifying the general conditions of well-being of animals.

The system is evolving in order to be integrated with the proper management of the veterinary drug, an indissociable part in the judgement of animal welfare.



FREQUENTLY ASKED QUESTIONS

IS IT TRUE THAT BREEDING FARMS USE AN INDISCRIMINATE AMOUNT OF ANTIBIOTICS?

No. The use of antibiotics on farms is subject to the compliance with strict rules. Not only is preventive treatment prohibited, but drugs can only be used in the presence of diseases and after prescription. Drugs permitted are those authorised by the health authorities and their use must be limited in time. To minimise the risk for people, it is compulsory to comply with the “suspension period”, i.e. waiting a certain number of days after the discontinuation of treatment before slaughter. In any case, the problem of **antibiotic resistance** (i.e. the appearance of bacteria which have developed resistance to certain antibiotics) is very serious and important, to the point that the WHO has drawn to an overall approach that regards livestock, but also the use of non-suitable antibiotics in human medicine.

ARE HORMONES PRESENT IN BEEF?

In Europe the use of substances with hormonal effects is prohibited in the livestock sector (bovine, poultry and pork chains) since 1981. Their use, furthermore, besides being prohibited by the regulations would be useless, if not counterproductive.

WHAT ARE THE CONTROL MEASURES ON TRACEABILITY AND SAFETY OF MEAT IN ITALY?

The quality and food safety, in Italy as well as throughout the European Union, are such a priority as to consider the Regulations on food safety among the EU regulatory milestones. Amongst all control systems activated in the last few decades, the most important are those related to the traceability and labelling of meat products. The European strategy is to prevent any contamination of foodstuffs from substances present in the environment or due to human activities (preventive actions), and create a network of controls that constantly monitors the presence of residues of substances in food that could be harmful to public health (control actions). Among the preventive actions, is a self-control plan by all operators in the food sector, implemented with the application of HACCP (Hazard Analysis and Critical Control Points). This, in particular, aims to prevent the presence in food of substances potentially harmful to the human body, from a downstream control of the foods that end up on our tables to controlling each stage of their production. With regards to control measures, since 2006 acceptability limits of the contaminants have been defined in foods such as nitrates, mycotoxins, heavy

metals and dioxins.

At the same time, research organisations have been commanded to carry out a consistent scientific analysis of the impact that the known contaminants can have on human health, and the potential toxicity of new substances used in agriculture.

For six years, moreover, three Regulations (149, 260 and 839 of 2008) were adopted relating to the maximum limits for pesticide residues (MRLs) in foodstuffs, for the use of pesticides on crops intended for animal feed. The reliability of these limits is verified by the EFSA (European Food Safety Authority), an independent body that provides scientific advice on all matters that affect food security. In Italy, however, the Ministry of Health annually issues the National Plan for the Search of residues (PNR), which shows the results of the analysis regarding the presence of residues of toxic substances in food.

According to the NRP Final Report of 2017, the results of the monitoring plan have shown that as many as 99.91% of the samples were in accordance with European regulations.

ARE GMO DANGEROUS?

In the debate on food safety, one of the most contentious issues definitely concerns Genetically Modified Organisms

(GMO), often accused of representing a danger to human health and the environment. The question is delicate, because it brings into play different points of view.

What is a GMO? Literally, the term “genetically modified” refers to any “organism whose genetic material has been altered in a way that does not occur naturally by mating and/or natural genetic recombination”. Indeed, the improvement or modification of the genetic characteristics of an animal or a plant species has been common knowledge for ever.

So it is good to clarify that the GMO techniques “on trial” are those that have developed over the last 40 years, that permits the change of some features of living species “in the laboratory”: for example, you can increase the resistance of a plant to pesticides or certain parasites, improve the nutritional profile and the ability to adapt to adverse weather conditions (e.g. increasing the resistance in case of drought). The main GMO crops worldwide are **soybeans, corn and cotton**.

In the document “20 Questions on Genetically Modified Organisms”, the WHO said that there is no evidence that GMO foods currently on the market represent a risk to health. Similarly, no negative effects on health has been noted from the consumption of GMO foods in the countries where they have already been approved. However, their use in the agri-food sector is opposed by a considerable part

of public opinion, for reasons mainly related to environmental and ethical issues that have little to do with food safety itself.

IS IT TRUE THAT THE MEAT FOUND IN THE SUPERMARKET ALL COMES FROM ABROAD?

The Italian beef production is insufficient to meet domestic demand: currently about 40% of live calves and meat is imported from other European countries.

Live calves of beef breeds, which are characterised by a high level genetic profile, are bred in Italy integrating perfectly with the wide availability of quality corn in the Po Valley and the increasing possibilities of pastures and fodder for the reduced production of durum wheat, especially in the centre-south. Through breeding techniques perfected over the years and in particular the best practices in nutrition and in respect of animal welfare, the Italian chain ensures the quality and safety of meat “bred in Italy”. Thanks to the traceability system, on the label of the final product it is always possible to check the animal’s country of origin.

ON FARMS ARE ANIMALS REALLY ABUSED AS SHOWN ON SOME TV SHOWS?

The respect of animal welfare in farming, transport and slaughter has taken on great significance in recent years, in the European Union as well as in countries that export meat

to Europe, obliged to comply with standards equivalent to those applied to EU members. The reasons are many, but beyond the undoubted ethical value and therefore the attention of public opinion and of the control bodies, there is also a purely economic reason: potential stressors and poor living conditions not only create conditions of unnecessary suffering to the animal, but also low quality meat and low productivity levels.

The European Union is particularly advanced in the field of welfare of farm animals: the Commission is in fact working hard to increase the level of animal welfare in the member States, with continuous investment in the improvement of regulatory standards. An effort that leads Europe to invest an average of 70 million Euro per year in actions aimed solely to the protection of animal welfare.

In the European Union all those rearing methods that cause suffering or injury to livestock are prohibited, and it requires that animals are observed daily and, if necessary, treated.

Not only that, according to European legislation freedom of movement to all animals must be guaranteed, while the equipment for the administration of feed and water must be designed, constructed and installed so as to minimise the chances of food or water contamination, and the negative effects of competition between animals.

IS IT TRUE THAT CHICKENS GROW IN CLOSED CAGES?

No, it is not true. And to confirm this, simply visit one of more than 6,000 Italian farms, where all the chickens, turkeys and other poultry for meat are not kept in cages, but on the ground, free to roam in spacious and bright areas, moving on layers of straw or wood chips that are absorbent and hygienic. In some cases, there are also open-air farms. For over 50 years, from the early '60s, the "battery" breeding of chickens for meat does not exist.

This prejudice (common today to as many as 8 out of 10 Italians) is mainly due to the legacies of the past and to an erroneous confusion between the rearing of broiler chickens and that, still widely diffused today, of egg laying hens, where the animals are no longer bred in batteries, but in cages according to the most recent Community legislation on animal welfare, so as to ensure the animals ease and health, together with hygiene of eggs produced.

Next to the horizontal rules, which guarantee the welfare of any animal species in farming, transport and slaughter, also numerous vertical regulations are in force, which establish the welfare requirements in the breeding of each species, including egg laying hens or broilers.

The commitment of the poultry sector in ensuring a smooth and optimal application of these laws throughout the country has resulted in important initiatives, such as

the drafting of the "Operating Procedures for the protection of poultry during transport" manual, in collaboration with the Italian Company of Preventive Veterinary Medicine and with the approval of the Ministry of Health. Still awaiting approval by the same Ministry is, on the other hand, the "Proper operating practices for poultry hatcheries" manual. Finally, the poultry industry (UNAITALIA) has promoted a number of training courses on animal welfare for livestock farmers throughout the country, training more than 1,500 farmers.

Now all broilers are raised on the ground and sexes are separated in special sheds, where the density is usually maintained at around 30-33 kg of live weight per square meter (corresponding to a maximum of about 12 chickens, with an estimated average weight to 2.5 kg) at slaughter. Breeding on the ground is, among other things, the preferred choice considering the positive effects on the organoleptic characteristics of the meat, which are in this way much more pleasing to consumers.

The current laws in Italy (Legislative Decree. 27/09/2010 n. 181) provide that both the owner, and the holder are responsible for animal welfare and the application of the measures foreseen. The norm sets a maximum stocking density equal to 33 and 39 kg/m² depending on the environmental conditions of the farms. In an interview in March 2014 for the magazine Food, the president of UNAITALIA Aldo Mura notes still many prejudices

and myths resist regarding poultry meat: "For example, only 3 out of 10 Italians know that 99% of the chicken we eat in Italy it is bred in our country and to verify this all you have to do is simply read the label. Similarly, over 80% of Italians ignore that the breeding of broiler chickens happens on the ground and not in a cage". To inform consumers properly, UNAITALIA launched the blog www.vivailpollo.it, a site with answers also to doubts and curiosities.

IS IT TRUE THAT CALVES ARE BRED IN CAGES?

Contrary to popular belief, the rearing of calves is not allowed in cages. Animals should in fact remain exclusively in barns and in groups to respect the highly social features that characterise the behaviour of these animals. In this regard, the rules are established by a Legislative Decree July 7th, 2011, n. 126.

They require that no calf older than eight weeks may be confined in an individual pen; each individual pen must not have solid walls, but perforated walls which allow direct contact, sight and touch amongst the calves.

As for the calves kept in groups, instead, the free space available to each calf varies according to the weight: and must be at least 1.5 m² for each calf of a live weight less than 150 kg, at least 1.7 m² for each calf with a live weight of 150 kilograms or more but less than 220 kilograms, and at least 1.8 m² for each calf

with a live weight equal to or greater than 220 kg.

In addition, they must ensure thermal insulation, heating, ventilation and proper lighting in order to maintain the healthy environment and encourage growth and well-being of calves. In addition to these conditions, the building must be able to allow each calf to lie down, rest and stand up without difficulty.

DO PIGS LIVE IN THE DIRT?

Often mistakenly pigs are thought of as dirty animals. Actually pigs, having little ability to sweat, in nature tend to roll in mud to cool off and control pests. When confined in an enclosure of sufficient size, they tend to defecate in defined areas (unlike other farm animals), keeping their rest and activity areas clean. There is also the Legislative Decree of 7th July

2011, n.122 (which in fact is the law that applies in Italy as a transposition of Directive 2008/120/EC), relating to the management of breeding pigs. This standard contains many requirements for the protection of health, in particular in relation to the space available for each animal, the type of flooring and the provision of specific material because pigs can root around.



NOTES

¹ For more information, refer to the website of the One Health Initiative organization (www.one-healthinitiative.com/)

² Regulation (EC) 1831/2003

³ Commission Communication 2015/c 299/04, Guidelines on the prudent use of antimicrobials in veterinary medicine

⁴ The Population Correction Unit is a theoretical value determined on the basis of the average weight of the livestock on which the treatments and number are carried out animals slaughtered in the year in question, taking into consideration imported and exported animals exported to be fattened and slaughtered

⁵ AIA, AISAM ASSALZOO, FNOVI. Good practice for the use of antimicrobial drugs in animals intended for food production

⁶ Zoonosis are infections or diseases that can be transmitted directly or indirectly between animals and humans, for example through the consumption of contaminated food or contact with infected animals. In humans these diseases can have different severity, depending on the type of pathogen and the physical condition of the infected person, with clinical pictures characterised by mild symptomatology up to potentially lethal diseases

⁷ Commission Regulation (EC) 2073/2005 European Union of 15th November 2005 on microbiological criteria applicable to foodstuffs, OJL 338 of 22.12.2005, pp. 1-26

⁸ Opinion of the Scientific Panel on Biological Hazards on a request from the Commission related to the effects of Nitrites/Nitrates on the Microbiological Safety of Meat Products, 2003, The EFSA Journal, 14, pp. 1-34

⁹ The risk assessment explained by EFSA, 2017. Nitrites and nitrates added to food

¹⁰ Regulation (EC) 178/2002 introduced the current food safety model, marking the start of a real re-organization process of the relevant Community legislation

¹¹ Regulation (EC) 882/2004 represents the framework regulation for the organization of official controls on food, feed, health and animal welfare

¹² For more information on the regulations of the Hygiene package, please refer to the Ministry website of Health (www.salute.gov.it/portale/temi/p2_6)

¹³ Food frauds (health and commercial) (www.izsalimento.izsto.it/palimenti/index.php/laspesa/frodi-alimentari)

¹⁴ Reference legislation on food safety (www.izsto.it/index.php/istituto/93-reportdatisanitari/sicurezza-alimentare/535-normativa)

¹⁵ Autorità Europea per la Sicurezza Alimentare, EFSA - European Food Safety Authority

¹⁶ Regulation (EC) 852/2004

¹⁷ INALCA. Sustainability Report 2014, chapter 9

¹⁸ Mipaf List of Italian denominations, filed in the Register of protected designations of origin, of protected geographical indications and of the traditional specialties guaranteed (EU regulation n. 1151/2012 of the European Parliament and of the Council of 21st November 2012) (updated to 2/7/2018)

¹⁹ For more information, see: AICIG, association Italian Consortia Geographical Indications

²⁰ Ministry of Health. "Report on the system of European alert - 2016 "

²¹⁻²² INEA, 2012

²³ Regulation (EC) 1782/2003

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ECONOMIC AND SOCIAL ASPECTS OF MEAT CONSUMPTION

-
- ❖ THE SIZE AND ECONOMIC TREND OF THE SECTOR
 - ❖ ORGANISATION OF THE COMPANIES
 - ❖ THE COST FOR CONSUMERS

Introduction

THE MEAT CHAIN
CONTRIBUTES TO ABOUT
15% OF THE ENTIRE
ECONOMIC RESULT OF THE
ITALIAN FOOD INDUSTRY

THE ORGANISATION
OF AGRICULTURAL
OPERATORS IS
FUNDAMENTAL FOR
THEIR ECONOMIC
SUSTAINABILITY IN THE
MIDDLE AND LONG TERM

WHEN MEAT IS INSERTED
IN A BALANCED DIET
IT DOES NOT INVOLVE
EXCESSIVE COSTS FOR THE
CONSUMER

The economic and social theme in meat production is extremely complex because it takes into consideration very different and apparently distant topics.

*The macroeconomic aspects linked to the performance of the sector in the world and in the various geographical areas must in fact be accompanied by a **territorial analysis** that examines how the companies that make up the sector are organised. Although many people associate the (relatively few) brands of the meat processing industry to the meat industry, it is important to remember how the livestock supply chain lays the foundation of the many companies that manage the breeding farms and, increasingly, the cultivation of foods.*

*This aspect is particularly relevant in **Italy** where the reality of production is characterised by a **large number of family-sized**, or slightly larger, companies which give con-*

tinuity to the tradition over generations in a complex and heterogeneous system highly linked to the rural dimension. On the one hand, these peculiarities have the advantage of passing on quality over time (which is why Italian food is world famous), but on the other hand they make economic sustainability of the companies precarious, increasing, among other things, the risk of abandonment of the territory by the farmers and their families.

*For this reason, **the tendency towards aggregation and forms of stable partnership between companies of various sizes must be seen in a positive way**, as the goal is to ensure economic sustainability, whilst maintaining the original identity. This trend, highly developed in countries that make wealth out of agriculture, allows the organisation of supply chains for better product control. A fundamental aspect of an **“organised”***

***system** is the possibility of better integrating with the various related production systems (meat, milk, cereals), increasing productive efficiencies as much as possible.*

Last but not least is the analysis of the cost for the consumer who is increasingly attentive to food choices. Meat and cured meats are products that are normally placed in a medium-high cost segment but, as shown by the construction of the “economic hourglass”, even in this case the equilibrium pays off: an adequate consumption consistent with nutritionists’ indications does not incur excessive costs for consumers.

In reality the trend that the producers are starting to take into account is “less but better” that is moving purchase preferences towards products of a superior quality, perceived or real, even if higher costs are incurred.

1 THE SIZE AND ECONOMIC TREND OF THE SECTOR

Despite the data over the last 50 years shows a general growth of the sector in the world, a detailed analysis allows us to observe how this growth is neither constant nor homogeneous.

1.1 Evolution in the world

To get a general overview of the sector's performance worldwide it is possible to take into account the data of the historical series of the FAOSTAT database regarding the number of animals bred of the main species (bovine, pig and poultry) in the various regions of the world¹.

As for the bovine species in the world there are raised about 1.68 billion head with a growth of about 48% over the last fifty years. Asia and America are the areas with the highest number bred and with constantly growing trends. Europe, and with it Italy, is characterised by a reduction trend that since 1996 (the year of BSE) has reduced the number of animals raised until stabilisation over the last decade. In Italy alone, the cattle population from 1961 to 2015 was reduced by approximately 40%, resulting in the abandonment and consequent depopulation of the countryside. In 2017 there was a reverse trend, with a gradual increase in the number of cattle raised.

The production of pork is dominated by Asia, where 58% of the 990 million heads bred annually in the world are found. The growth trend shows an increase of about 60% compared to the 1960s, sub-

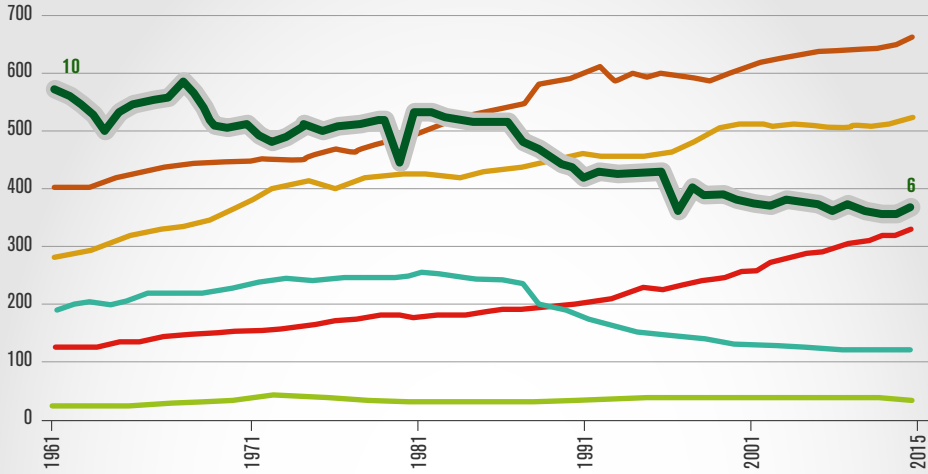
stantially driven by the increase in Asian production. As for bovine herds, also for pigs, data is substantially stable in the last decade. Unlike the other species for which the data are much more heterogeneous, the values for breeding poultry show a widespread increase since the seventies. The overall production has in fact increased by almost 5 times in the fifty years between 1960 and 2010: also in this case Asia is the region where the increase is greater. Europe confirms itself a region with a trend reversal that began in the 1990s, although, unlike other species, the last decade shows a slight increase in the number of head bred. Notwithstanding the fact that the data of the head bred does not closely coincide with the consumption of meat in the same areas due to the phenomena of commercial exchange, this information can help to understand the phenomenon of sustainability in the livestock supply chain and, consequently, help the investment of resources and technologies to mitigate environmental impacts and to better manage the topic of food safety and animal welfare.

1.2 The Italian situation

The agri-food sector in Italy contributes about 15% of the annual gross domestic product, with a total value of around 180 billion Euro. Of these, about 30 derive from the meat sector, of which 10 from the agricultural supply chain, and 20 from processing. The substantial differences

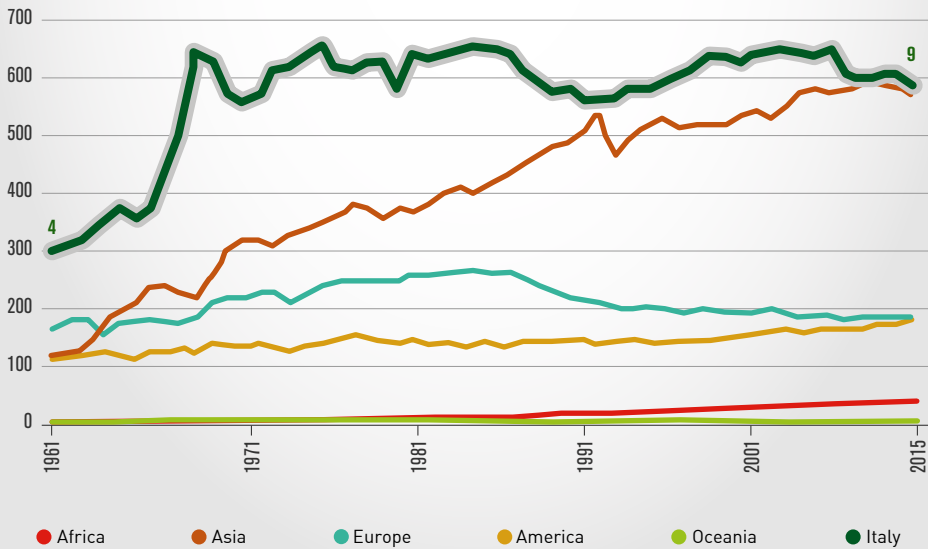
PERFORMANCE OF BOVINE HEAD BRED

millions of animals/year



PERFORMANCE OF PORK HEAD BRED

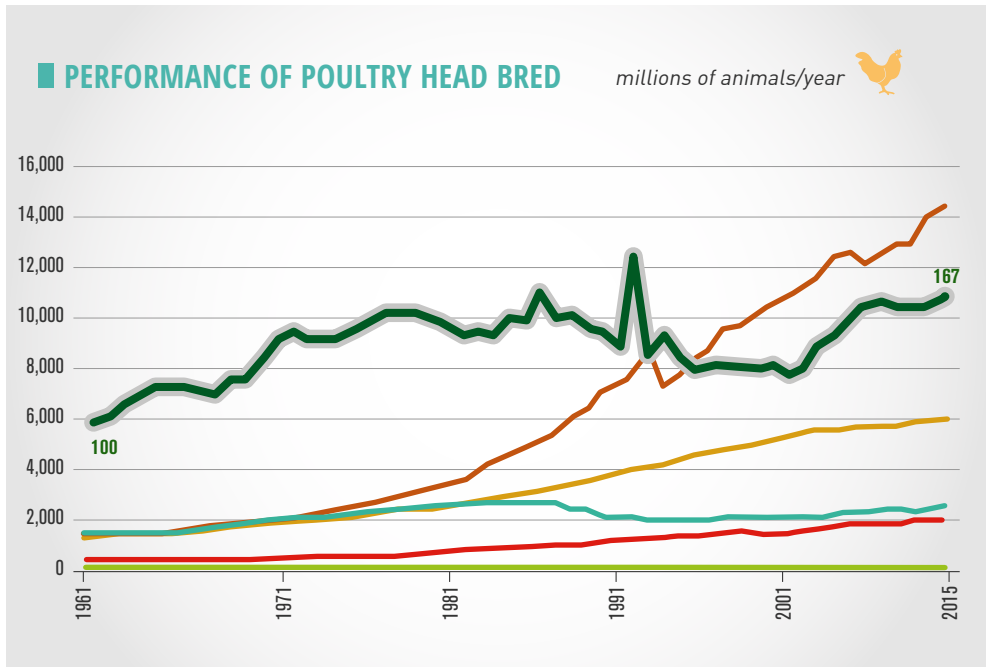
millions of animals/year



Average head on the farm.

The Italian trend is out of scale compared to that of other regions of the world.

Source: FAOSTAT (Live animals, stocks, Cattle and buffaloes e Pigs, 1961-2016).



*Average head present in breeding farms per production cycle.
The Italian trend is out of scale compared to that of other regions of the world.
Source: FAOSTAT (Live animals, Poultry birds, 1961-2016)*

between the three main supply chains lie in the trade balance as well as in the distribution of the value between the agricultural and industrial supply chain.

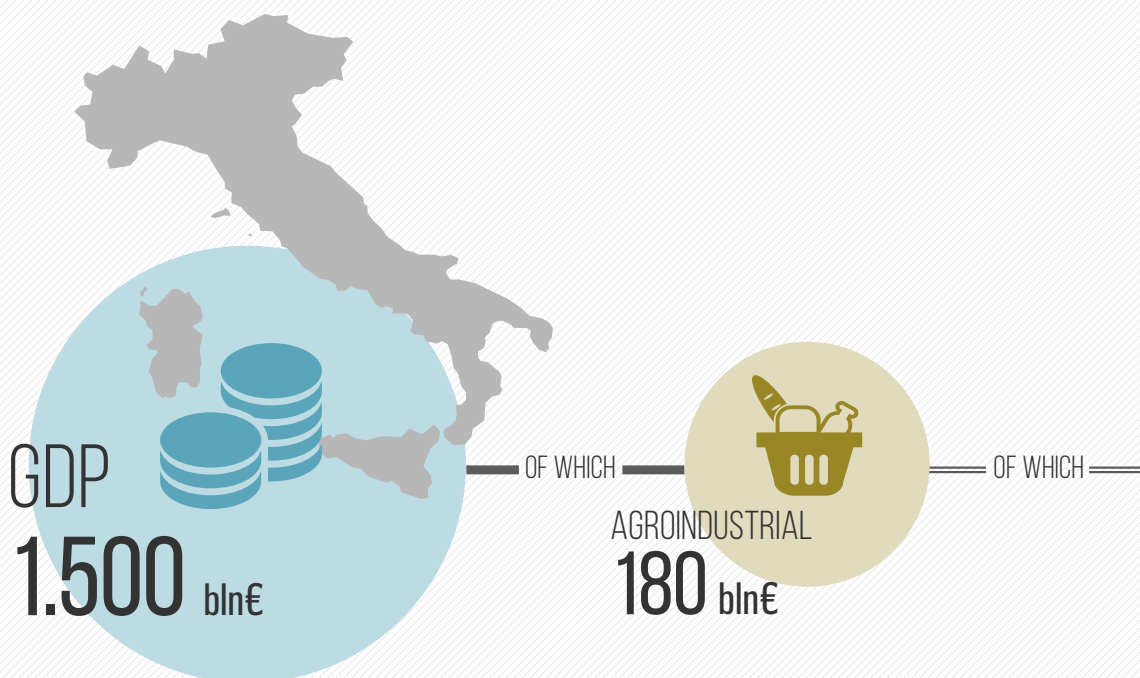
In the case of bovine, the trade balance is negative: Italy is in fact a strong importer of live cattle for fattening and beef (fresh, chilled or frozen, for consumption or subsequent industrial processing). The self-supply rate of our country, obtained from the ratio between production and apparent consumption, is around 50% (ISMEA markets²). Regarding the pig industry, the trade balance of live animals sees imports that are around one million heads and exports almost negligible (a few thousand). In general, more than half of the pigs reared in Italy produce meat used internally, the remaining part (such

as fresh meat or raw materials for cured meats) is imported³. The dependence from abroad is around 40% of the total needs. In the case of pork meat, most of the economic value is generated by the processing industry mainly thanks to the production of cured meats that, among other things, allow our country to export products with high added value both qualitatively and economically. Unlike the others, the poultry supply chain makes Italy self-sufficient with a production slightly higher than requirements. The economic value is generated mainly by transformation with a trend of growth.

MEAT AND CURED MEATS IN ITALY

ECONOMIC DIMENSION OF THE SECTOR

DATA IN BILLIONS OF EURO PER YEAR

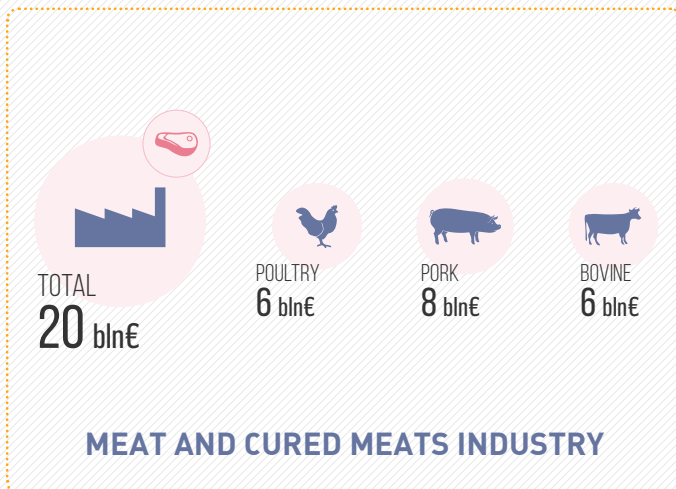


Macro-economic dimension of the meat sector in Italy. The information presented has the purpose of providing a general indication and is the result of reprocessing statistical data published by ISMEA* and ISTAT** that is recommended to consult for any further information or details.

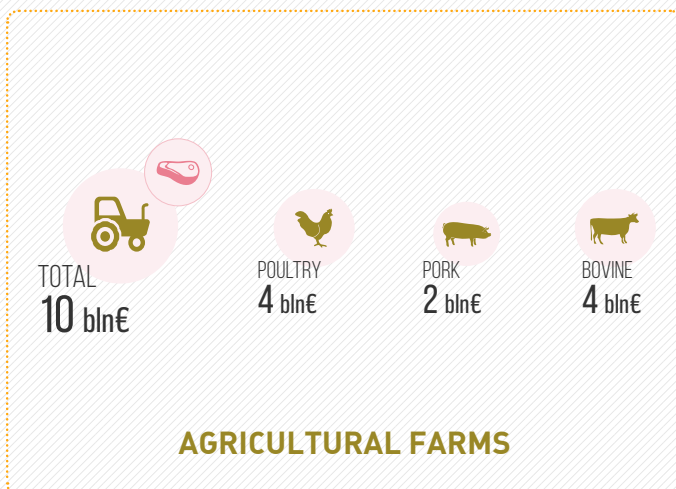
*www.ismeaservizi.it **www.agri.istat.it






OF WHICH



OF WHICH



		HEAD BRED AND NUMBER OF COMPANIES IN ITALY			
		2010		2016	
		COMPANIES	HEAD	COMPANIES	HEAD
TOTAL CATTLE		151,501	5,786,111	129,148	5,568,211
TOTAL PIGS		128,780	9,182,314	133,237	8,402,816
TOTAL POULTRY		6,321	575,000,000	6,973	674,000,000

Source: National database of the IZS of Teramo for the years in question.

The data refers to the annual consistency of cattle breeding (total data, excluding buffaloes) and pigs (total data) and for poultry, to the following categories: broilers, laying hens, quails for meat, turkeys (meat and breeding), geese, ducks and guinea fowl.



2 ORGANISATION OF THE COMPANIES

As is the case in many Italian goods sectors, the agri-food sector is also very articulated and organised into structures, often family-run, of a medium-to-small size. In reality, the trend is slowly changing and the market is moving towards companies of gradually larger sizes and better organised. These are “weak” but unequivocal signals, recordable not only in Italy but also in other territories of the European Union. The growth in size is largely determined by the reduction in the number of active companies that affected both the agricultural sector and that of the first and second industrial transformation⁴. From the ISTAT data it emerges that, in 2013 (latest available public data), the number of breeding farms was equal to about 189,000 units: the greatest presence of livestock farms is found in the northern regions, in particular Lombardy, Veneto, Emilia-Romagna and Piedmont. Only using the physical dimension is not enough to grasp the complexity of the Italian farm universe and its dynamics. To this end, the last General Census of Agriculture⁵ proposes another dimension, the economic one (ED).

The analysis shows that 63% of companies, while playing an important territorial role (in terms of presence, environmental protection and care of the landscape and the territory) from a strictly economic point of view produce a very low income (< 8,000 Euro/year), which must necessarily be complementary to other activities. In fact, diversification of activities is an im-

portant tool used by agricultural companies to achieve economic stability.

2.1 The importance of the “agricultural” dimension in Italian agri-food




The statistical data does not reveal the unmistakable characteristic of the Italian agricultural heritage: its “agricultural dimension”, the cultural values, identity, traditions and social membership that it represents.

Farmers by tradition

The Italian territory is historically characterised by a plurality of agricultural systems with a great diversity of landscapes, agro-ecosystems and socio-economic conditions, that over time have produced a multiplicity of economic realities, production facilities and relative markets.

About 80% of the half a million Italian farms are small businesses, to which must be added the countless practices of auto-consumption. This diversity and ubiquity represents the Italian specificities, on which rests the heritage of great wealth and agricultural biodiversity production that also represents the safest method to maintain the mountain and hill areas.

Some peculiar characteristics of farmer agriculture are fundamental: the different ways of family run businesses, the communities and cooperatives related to the work of land, local roots and the

	FARM'S CLASS OF INCOME		
	 < 8,000 €	 8,000 - 15,000 €	 > 15,000 €
NORTH-WEST	42.0%	13.0%	45.0%
NORTH-EAST	47.2%	12.6%	40.2%
CENTRE	66.5%	10.4%	23.1%
SOUTH	72.4%	10.1%	17.5%
ISLANDS	60.7%	10.9%	28.5%
ITALY	62.8%	10.9%	26.2%

Italian farms for economic dimension (ED)

Source: Table 1.1 p. 78 of 2013 General Agricultural Census

various conservative and sustainable agricultural practices, the control of the reproductive cycle through the reproduction of local seeds, traditional varieties and native breeds. Practices and methods that are now found in many forms of agricultural reality, of family tradition or new settlement, in every Italian region.

Land protection

The presence of these realities is very important and serves to guarantee the preservation and protection of the territory, reducing the continuing depopulation of agricultural areas by bringing back work and employment, thereby reducing the environmental costs (hydro-geological system, the maintenance of the soil and the protection of biodiversity), reconstructing the social and rural landscapes,

ensuring the presence of people in places that might otherwise be abandoned.

Land conservation is achieved mainly by using a wide variety of farm protection policies: it has been seen that severe hydro-geological instability increased when those agricultural activities that were carried out in full harmony with the territory stopped. The cultivated land, in fact, along with forests, play an essential role in stabilising and consolidating the slopes and holding back the river banks, thanks to their high absorption capacity, helping to prevent landslides and land erosion.

The protection of the territory by the farmer, whose maintenance work is essential especially in the marginal areas of the hills and mountain, must therefore be guaranteed by a proper environmental protection policy, supporting and

promoting the activities of the farmer. In the mountains cattle and sheep breeding is an excellent way for monitoring activities through the careful management of pastures.

Since there is a plurality of patterns of agriculture, for the purpose of proper land management, depending on the different production realities, appropriate and diversified measures are necessary, recognising agriculture as a socio-economic model and consequently identifying standards that are appropriate for it.

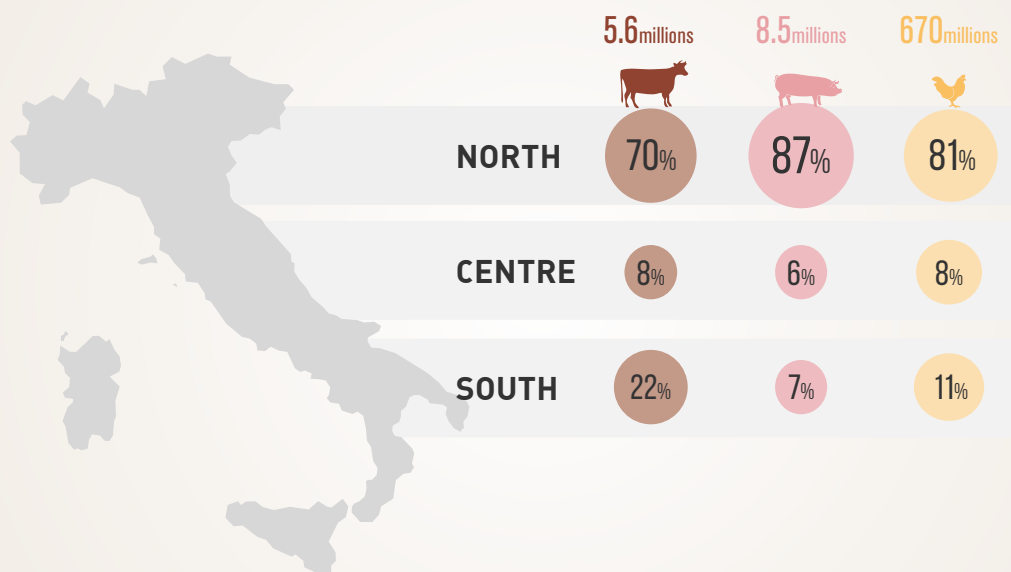
European agricultural policy (PAC) - the

set of rules that the European Union, since its inception, has sought to create, by recognising the central role of agriculture for an equal and stable development of its member countries⁶, is specifically intended to help farmers not only to produce food but also to protect the environment, improve animal welfare and to maintain rural communities economically alive.

The profession of agriculture

The fragmentation of farms makes economic sustainability difficult for them and

LIVESTOCK PRODUCTION IN ITALY



Livestock production in Italy and its distribution.

Data source: IZS Teramo 2016 (bovine, pig and poultry sector), UNAITALIA, 2016 (preliminary data for the poultry sector)

the entire food farming sector, with the risk that farmers and their families abandon the land. For this reason, the tendency to organise themselves into cooperatives or small and big industries must be judged positively, since the objective is to ensure the economic sustainability of the companies themselves, while maintaining their original identity. This trend is highly developed in countries that make agriculture a source of wealth, and allows for the organisation of supply chains which,

as can be seen, are those that provide the most control over the products. Finally, a fundamental aspect of an “organised” system is the ability to better integrate the various related production systems (e.g. Meat, milk, cereals), thereby maximising production efficiency.

This agriculture, “by profession”, is the most representative of the main supply chains for meat production in Italy.



HISTORICAL AND SOCIAL ASPECTS OF MEAT CONSUMPTION IN HUMAN HISTORY

edited by Massimo Montanari and Giovanni Sorlini

The history of man has been, first of all, to continually search for answers to his food needs, at a time when food was the essential reason for survival, the first and unavoidable daily necessity. How can we not think of the vivid images of cattle in the French caves of Lascaux, whose meat was already at that time probably the main source of livelihood for the European primitive man?

At some point in history, however, the pure need for food transforms into pleasure, an element constituting a particular social affiliation; a radical transformation of its original function to the exact opposite, represented by the research of hedonism and cultural belonging. This dual polarity, or rather the change in the function of meat, unfolds a complex history, closely linked to power relations and social inequalities that went with it. The history of this food is closely interconnected to mankind's history, which constitutes one of the basic elements, in each case either the cause or the effect of human events. When trying to identify some of the stages that we consider particularly significant, the first that seems appro-



prate to recall is the fall of the Roman Empire: during the centuries III-VI AD, the dissolution of this millennial cultural horizon has indeed given way to the establishment of new political and administrative realities, the turbulent mixing of peoples and cultures, the depopulation of the countryside and the breaking up of the patterns of production and food distribution, present at the time. In this moment in history we are witnessing the depletion of the food model based on the cultivation of the fields, determining the general conditions of food scarcity and, with them, an unquestionable period of hunger. In this period of history in fact the testimony of

war, famine and pestilence are widely documented by historians of the period and with them especially the general demographic decline of the European population. The European man of the III-VI century, from consumer of products obtained from the cultivation of the fields, the typical model of the Roman period, differentiated himself, by significantly using products from the forests, which in those centuries grew heavily at the expense of agricultural land, often not able to be used due to the demographic imbalances of that difficult period. The need to develop a new model of consumption that combined the traditional model of the cultivated ager

with the exploitation of uncultivated areas typical of the barbaric matrix (the so-called *saltus*, a term used by the Romans, not without a pejorative connotation towards the peoples beyond the Alps), determined the process of more food supply systems which together formed the foundations of a food model in which we Europeans still recognise ourselves today.

For meat, we can say that the controlled production model typical of the Romans and based primarily on the rearing of small ruminants in confined spaces, is combined with the spontaneous model of Germanic and Celtic matrix, based on the exploitation of virgin nature and uncultivated spaces, ideal for example for hunting, or the natural breeding of wild pigs.

In this historical phase, in which various food supply systems in different and distant historical and cultural origin are integrated and the cultivation of the fields becomes more difficult because of demographic imbalances, meat becomes once again a mainstream food, the food value "par excellence".

If the Latin doctor Cornelius Celsus considered bread to be the absolute best food, the icon based on the cultivation model of the fields, his colleague Antimo of the sixth century did not hesitate



to consider meat as the "king of food", showing a particular sensitivity to pork; so dear to the powerful of the time, the court of Theodoric in Ravenna. In other words, Antimo was already influenced by food supply models based on the exploitation of uncultivated areas, particularly important in that historical period. Again *ager* versus *saltus*.

In later centuries, characterised in Europe by the consolidation of Christian thought and, with it, the symbolism of oil, wine and bread as food symbols of purity and rectitude, meat however does not lose its core value. In the Europe of the post barbarian invasions, in fact, there seems to finally have been determined an unprecendented and definitive integration between the culture of bread and that of meat, so that both end up enjoying

the statute (no less ideological than material) of primary and indispensable food.

In the Christian era, the polarity between the Roman and barbaric model overlaps with that of the "monastic" and "aristocratic" model: between them they play for the leading role of cultural hegemony. A comparison with many different sides and meanings, where social ethical values clash with those of religious morality, the reasons for fasting with those of power and strength.

How can we not consider Charlemagne to be the archetype of this cultural tension? The first emperor who contributed to the modern picture of Europe left us a historical trace, constantly torn between warlike images of abundance of food, that hinged on the consumption of meat and the Christian ethic of moderation. The first

monarch who made meat consumption an element of his powerful iconography, without denying the values of frugality and moderation in food consumption of the Christian religion that he had embraced, and that animated his political actions. From the start of the eighth-ninth century, thanks to this successful integration between the agricultural food model and that based on the exploitation of forests, the demographic curve starts to rise again, and with it, deforestation, land reclamation and the colonisation of uncultivated areas to build new agricultural settlements.

Again, a new intensive agriculture at the expense of forestry was the inevitable reaction to the growing demand for food, especially proteins, and, with it, a demand of civilization and progress: from then on, the concepts of natural and wild related with regards to the food industry are relegated to the margins of production and its dominant ideological values. It is the beginning of a big boom, which probably continues to this day. But agrarian expansion brings with it new tensions and social inequalities, conflicts born from the search for fertile lands, duties claims and property

rights, as well as natural disasters, as frequent then as today.

Here the countryside-cities model is born, with all the implications related to the distribution and the storage of food on a large scale. It is a model that ensures stability and the balance of noble protein sources and culminates in the thirteenth century, especially after its progress in agricultural production techniques and more favourable weather climates. This nutritional well-being, the abundance represented by the new wide availability of meat, reaches such a level that even



Agostino Verrocchi, Rome 1585-1659, Oil painting on canvas. Private collection. Modena

the Pope Innocent III feels the need for an indictment against the sin of gluttony and the new delicacies that the insane passion of men has managed to invent.

“Wine, beer, or the good things that come to us from the trees, the earth, the sea, the sky are no longer enough: you want spices and perfumes”.

It is in this century, in fact, that gastronomy is born and its written codification of food recipes, due precisely to the abundance of flavours and gastronomic delights that the cultivation techniques and the expansion of the spice and food markets allowed.

Over the centuries of food abundance meat consumption represents a status symbol, particularly in the fourteenth century, during which there was a reduction in cereal crops in favour of pasture and forage crops.

It is in this period that farms specialised in livestock breeding are born, with its focus on the short and long-range meat trade. It is the so-called carnivorous period of Europe, like the lucky definition that Braudel has accustomed us to call it. A period of happy and individual life, which will last until the XVI century.

The repeated pleas of the ecclesiastical community to eat less, at least in certain periods of the year, more than being a deterrent, indirectly

confirms the centrality of the role of meat in the food system of the time. In modern times, with the emergence of the middle classes and the industrial revolution, meat reaches larger sections of the population. In the wider horizon of a new food democracy, the concept of quality and industry standards were born; with the progress of scientific knowledge, the nutritional properties of meat and its relationship with our health were better associated.

In the past century of efficiency and technology, in a context of even greater food availability, the new model of thinness as the ideal beauty of a powerful body, with perfect productivity, speed

and efficiency is finally imposed; even in this new context, the unstoppable rise in consumption of meat continues, without losing the symbolic value of a conquered dignity to social classes who once were hungry.

And today? Meat is always at the centre of this story of hunger and abundance. Forgotten the famine of the past, we live with abundance and its problems.

In this polarisation between two extremes that have always chased each other in history, today the real challenge is that of moderation and balance. The rediscovery of the original value of the

meat as a good and necessary nourishment and, with it, the word “diet”: a term invented by the ancient Greeks to designate the daily food regimen (but more generally the rule of life): knowledge necessary for a conscious, varied and balanced food consumption, that each individual has to build on their personal needs, attitudes and knowledge of himself. Unlike today, where this word expresses, more superficially, the simple restriction or deprivation of particular foods, often following trends or models imposed by consumer society.

This is the role of meat in the modern diet, a precious and irreplaceable food that finds its rightful place in the Mediterranean Diet, as intended by the wise fathers of our civilisation and not that of some propagators of today, who are more interested in market dynamics rather than our true cultural identity.

3 THE COST FOR CONSUMERS

At a time when the economic crisis is the protagonist of everyday life for businesses and households, we have tried to present a brief insight into the importance of the cost of food in household consumption. It is indeed interesting to note that the proportion spent on food has declined significantly over the past forty years, at the expense of items such as housing or recreation.

In the context of food consumption, meat contributes to about 19-22% of the total monthly “bill” of an average family. In this context it is interesting to look for a relationship between spending and the adoption of “sustainable” diets, such as, for example, the Mediterranean nutritional model. Income levels are indeed often used to determine the quality of life and the type of food eaten.

Many authors⁷ have developed scientific studies in this regard and in this document too, we also decided to present a re-interpretation of the public data in order to provide an additional perspective.

Using the same approach as with the environmental information, the amount of daily food recommended by INRAN (now CREA - Food and Nutrition) has been multiplied by the average prices of individual product categories, as reported for the month of February 2016 by the Observatory for Prices and Tariffs⁸.

The conclusion to which it arrives, which is clearly shown in the “economic hourglass” graphic is one that, by following a diet with the “correct portions”, the meat category does not have higher costs than fruit and vegetables, for which the unit cost is lower, but suggested consumption is greater.



	2015		2016	
MEDIAN MONTHLY EXPENDITURE	€ 2,144		€ 2,141	
AVERAGE MONTHLY EXPENDITURE (=100%)	€ 2,499	%	€ 2,524	%
FOOD PRODUCTS AND NON-ALCOHOLIC DRINKS	€ 441	18%	€ 447	18%
NON-FOOD PRODUCTS	€ 2,057	82%	€ 2,076	82%
ALCOHOLIC DRINKS AND TOBACCO	€44	2%	€ 45	2%
CLOTHING AND FOOTWEAR	€ 116	4%	€ 118	5%
HOUSING, WATER, ELECTRICITY AND OTHER FUELS	€ 902	36%	€ 902	36%
FURNITURE, HOUSEHOLD ARTICLES AND SERVICES	€ 104	4%	€ 107	4%
HEALTH SERVICES AND EXPENSES	€ 113	4%	€ 114	4%
TRANSPORT	€ 266	11%	€ 271	11%
COMMUNICATIONS	€ 63	3%	€ 62	3%
RECREATION, SHOWS AND CULTURE	€ 126	5%	€ 130	5%
EDUCATION	€ 15	0%	€ 15	1%
HOSPITALITY SERVICES AND CATERING	€ 122	5%	€ 128	4%
OTHER GOODS AND SERVICES**	€ 186	8%	€ 183	7%

*Median and average monthly expenditure*** of the sample households. Years 2015-2016, valued in Euro. Source: Istat, 2016*****

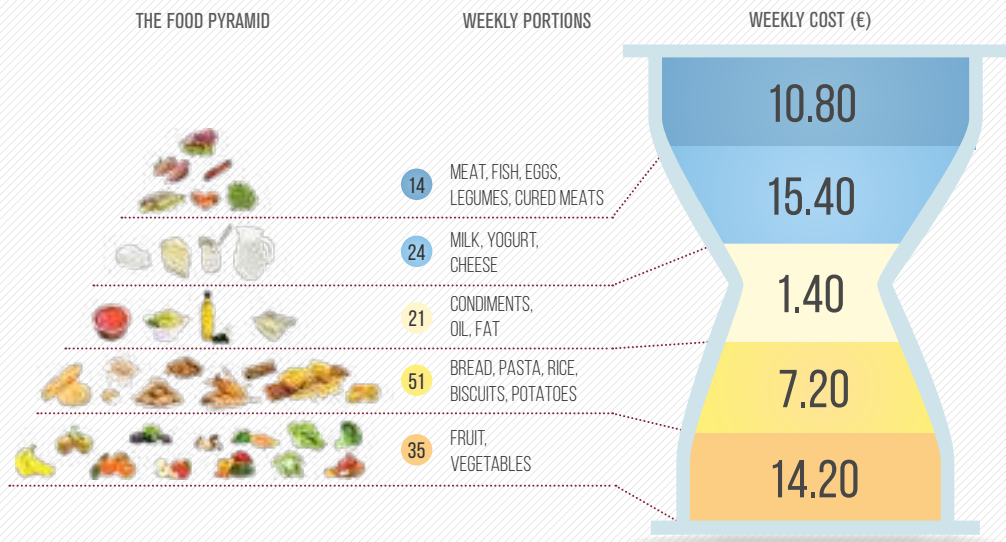
** They include goods and services for personal care, personal effects, social care services

*** The median monthly expenditure is the spending value for consumption that divides the distribution frequency into two equal parts (50% of families have a spending value for consumption that is lower or equal to the median, 50% have a higher value). Since consumer spending has an asymmetrical distribution, the median is always below the average value. The average monthly expenditure, however, is calculated by dividing the total expenditure by the number of families living in Italy.

**** Istat, 2016. year 2016 – The expenditure for household consumption.



THE ECONOMIC HOURGLASS



Economic Hourglass expresses the weekly cost of the diet suggested by INRAN guidelines (now CREA - Food and Nutrition), in analogy to what was described for the construction of the environmental hourglass's scenario B (intermediate). The weekly economic expense has been elaborated on the basis of the data provided by the Observatory for Prices and Tariffs, relating to the cities of Turin, Milan, Naples and Palermo, in February 2016.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE ECONOMIC VALUE OF FARMS IN ITALY?

The meat economic sector in Italy generates an economic value in the order of 30 billion Euro per year, compared with about 180 of the entire food sector and to 1,500 of the national GDP. The three main sectors (poultry, cattle and pig) generate an approximately equivalent value.

The differences lie in the analysis of the trade balance: the beef industry imports about 42% of its total requirement, the poultry industry is practically neutral, the cured meat industry is characterised mainly by exports of finished products, but by large importation of fresh pork meat.

In a country that, like Italy, is strongly affected by the effects of the global crisis, the economic role of the production of meat and dairy products on the one hand is the first item in Italian agricultural production, on the other plays an important role in various local economies, which largely contribute to the national total. Livestock farming is also a major source of income in the rest of the world.

WHY IS MEAT SO EXPENSIVE, COMPARED TO MANY OTHER FOODS?

As part of food consumption, meat contributes to about 19-22% of the total monthly

“bill” of an average family. The meat production chain is complex, and it is necessary to take into account the different aspects, from feed production, farm management, to the slaughter and subsequent meat processing, as well as the distribution and preservation. The presence of these phases, each of which is key, causes the cost of meat to be higher, compared with other foods of the same weight, especially if some foods are more “simple” and characterised by a short production chain.

Meat is more expensive when compared to other foods but this is not true in an absolute sense: take for example poultry, who surely have the best price to quality rapport or the production of beef which has a greater cost because the lifespan of the animal is longer.

Meat generally does not lead to higher costs if consumed according to the amounts suggested by the nutritional guidelines of the Mediterranean Diet, a concept well described by the “economic hourglass” (calculated starting from the same assumptions of the environmental one), which expresses the weekly cost of the diet recommended by INRAN guidelines (now CREA – Food and Nutrition).



NOTES

¹ Starting from the data available on the FAOSTAT website (www.fao.org/faostat/en/#data), were extrapolated data on the number of animals bred by species (bovine, porcine, poultry) used. The filter applied for the extraction is as follows: **Production** > Live Animals – **Regions** > Africa, Americas, Asia, Europe, Italy, Oceania – **Items aggregated** > Cattle and Buffaloes, Pigs, Poultry Birds – **Years** > 1961=2016

² www.ismeamercati.it/carni/carne-bovina

³ www.ismeamercati.it/carni/carne-suina-salumi

⁴ INEA, Report on the State of Agriculture 2013 (www.dspace.crea.gov.it/bitstream/inea/637/1/Rapporto_stato_agricoltura_2013.pdf)

⁵ ISTAT, 6th General Agricultural Census - Atlas of Italian agriculture, 2010. Published in March 2014 ([www.istat.it/it/files/2014/03/Atlante-dellagricoltura-](http://www.istat.it/it/files/2014/03/Atlante-dellagricoltura-italiana.-6%C2%B0-Censimento-generale-dellagricoltura.pdf)

[italiana.-6%C2%B0-Censimento-generale-dellagricoltura.pdf](http://www.istat.it/it/files/2014/03/Atlante-dellagricoltura-italiana.-6%C2%B0-Censimento-generale-dellagricoltura.pdf))

⁶ The agricultural policy (CAP) of the EU (www.europa.eu/pol/agr/index_en.htm)

⁷ Among the most active authors we can remember Drewnowski who in his works, some of them cited in the bibliography, relates the cost of foods, nutritional aspects, income of people and lifestyles

⁸ Goods and Services of Large Consumption, Prices collected for food, fish and fruit and vegetables - February 2016. Last access: May 2016 (www.osservaprezzi.sviluppoeconomico.gov.it/index.php?option=com_content&view=article&id=22:beni-e-servizi-di-largo-consumo&catid=14:livelliprezzi&Itemid=138)

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- Unione Europea: www.europa.eu



FOOD WASTE

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- 🌱 WHAT IS FOOD WASTE
 - 🌱 WHY AND HOW IS WASTE GENERATED
 - 🌱 HOW MUCH FOOD IS WASTED
 - 🌱 WASTE IN THE MEAT CHAIN

Introduction

IT IS APPROPRIATE
TO INTRODUCE
THE CONCEPT OF SOCIAL
VALUE TO IDENTIFY
CORRECTLY FOOD WASTE

THE MEAT SECTOR
IS AMONG THE MOST
VIRTUOUS, NAMELY ONE
WHICH GENERATES
THE LEAST WASTE

CONSUMER AWARENESS
IS CRITICAL FOR LIMITING
WASTE IN THE DOMESTIC
CONSUMPTION PHASE

IN THE EU EACH YEAR ABOUT 90 MILLION TONS OF FOOD ARE THROWN AWAY, FOR AN AVERAGE OF 180 KILOS PER PERSON

Source: European Commission (DG ENV), Technical Report-054, 2010 FOOD WASTE

The total amount of food produced worldwide each year amounted to about 4 billion tons, of which an estimated 30%, is lost before consumption. When the weight of the food waste is converted into calories, global food loss reaches **24% of the total production.**

The causes of waste can be found in a combination of effects, which belong both to the world of production, and to that of consumption: from the analysis of the causes, several initiatives aimed at reducing waste were born, with **particular attention to people's education.**

Without losing sight on the ultimate goal of reducing waste, an in-depth analysis of the available information makes it clear that we should avoid trivial errors, such as that of including in the waste both the

actually wasted food and the inevitable non edible waste. A correct interpretation of the concept of waste and its data should take into account the social value of food, separating what is recovered for purposes of human consumption from what instead is recovered as a resource.

In order to try to shed light on these aspects, the data available in the publication "**Feed the hungry**" of the Polytechnic of Milan and the Foundation for Subsidiarity in Italy was analysed, being considered among the most up to date from a scientific point of view. The agri-food chain is divided into several stages which include agricultural and/or industrial operations characterised by different degrees of efficiency and types of losses and waste. Starting with the losses of the primary sector

and the food processing industry, it continues with waste that occurs during distribution, both in collective and commercial catering, up to those of domestic consumption.

The elaboration of the available data shows how the meat sector is amongst those **less subject to the phenomenon of waste, both from the production side and from that of consumption.** Despite the inherently degradable nature of the marketed product, in fact, meat is the sector with the least social waste.

The reasons for this virtuosity are due to the structure and organisation of the supply chain, which allows the processing of by-products in secondary processes, but also the economic, cultural and social value attributed by consumers to these foods.

1 WHAT IS FOOD WASTE

The Commission for Agriculture and Rural Development of the European Commission has defined waste as:

“The quantity of rejected products from the agri-food chain that, for economic or aesthetic reasons, or because of the proximity of the sell-by date, although still edible and therefore potentially usable for human consumption, in the absence of a possible alternative use, are removed and disposed of, producing negative effects in environmental terms, economic costs and lost earnings for companies”¹.

Despite the “official” definition of the European Commission there are many publications which offer different interpretations, leading, as a result, to different estimates of the amount wasted. In the preparation of this document, it was decided to consider the publication “Dar da mangiare agli affamati”² (Feed the hungry), according to which the availability of food, that is, the amount of food produced, has three destinations:

- **HUMAN CONSUMPTION:** component of edible food that reaches people to satisfy their alimentary needs;
- **SCRAPPED FOOD:** inedible components of food that includes the remains of the transformation process, damaged products, broken or sub-quality standards, the inedible parts (bones, fruit stones, etc.);

- **FOOD SURPLUS:** edible part of the food that is produced, processed, transformed and distributed but not sold or consumed. Includes food purchased by the consumer but not consumed.

The excess food can in turn be divided according to how it is managed and its uses:

- **HUMAN NUTRITION:** used to satisfy human needs, through sale in secondary markets, charities, food banks, etc.;
- **ANIMAL FEED:** used to satisfy animal needs, through sale to kennels or zoos, or transferring them to companies dedicated to the production of feed;
- **VALORISED WASTE:** used for the production of fertilisers or the conversion to energy;
- **NON-VALORISED WASTE:** not used and disposed of in landfills.



1.1 Social wastage

According to this classification, it is therefore essential to introduce the social value of uneaten food to the definition of waste, so as to include only the food produced (and therefore edible) that is not used for human nutrition. The inedible parts should not be included in the definition.

For completeness, it is noted that other scholars³ include in the definition of

food waste the overfeeding of individuals, which is the difference between the amount of food a person consumes and the quantity really needed according to recommended calories, involving even the overweight and obesity (and resulting pathologies) in the debate.

It was decided not to follow this approach because it is closely tied to nutritional aspects whose in-depth analysis is beyond the scope of this chapter.

