

International Perspectives

What is meat in Italy?

Antonella Dalle Zotte,^{†*} Alberto Brugiapaglia,[‡] and Marco Cullere[†][†]Department of Animal Medicine, Production and Health, University of Padova, Agripolis, Viale dell'Università 16, 35020 Legnaro, Padova, Italy[‡]Department of Agricultural, Forest and Food Sciences, Università degli Studi di Torino, Largo Paolo Braccini 2, 10095 Grugliasco, Torino, Italy

Implications

- In Europe, the definition of meat is specified in the EU regulation No. 853/2004. This definition differs from that recognized by researchers.
- Italian consumers do not have a clear viewpoint of what constitutes meat. A recent survey showed that 61% of Italian respondents consider edible parts of aquatic species, frog, or land snail as meat also.
- In Italy, valuable indigenous cattle breeds are raised for meat production.
- Unlike than other parts of the world, Italian consumers also eat significant amounts of meat from veal calf, horse, rabbit, and quail.
- In the EU, Italy is ranked Number 1 with 21 Protected Designation of Origin-certified meat products.

Key words: European certification schemes, Italian consumers, meat consumption, meat products, unconventional meat

The Definitions of Meat in Italy

The definition of meat provided in the Regulation of the European Community (EC) No. 853/2004 (EU, 2004) and the definition currently used by food scientists differ from one another and are not necessarily how consumers define meat. There is no recent data available on how Italian consumers define meat; however, it is generally accepted that consumer perception of what constitutes “meat” is governed by socio-cultural, traditional, age, and gender-related contexts. For example, elderly consumers or consumers living in villages or the countryside have a strong preference for fresh and processed meat products, specifically species eaten, parts consumed, and further processed products produced. In the following section, the definition of meat will be described from the viewpoint of the legislator, the scientist, and the consumer.

What is meat for the legislator and the scientist?

The Annex I of Regulation (EC) No. 853/2004 (EU, 2004) defines meat as all the edible parts of animals, including the blood. The following categories are all considered meat under EC:

- Domestic ungulates of the cattle (including *Bubalus* spp. and *Bison* spp.), swine, ovine, and caprine species, as well as domestic solipeds (horse, donkey, and mule);

- Poultry, farmed birds, including birds that are not considered domestic but which are reared as domestic animals, with the exception of ratites;
- Lagomorphs, i.e., rabbits and hares, but also rodents;
- Wild game, i.e., wild ungulates, lagomorphs, and wild birds subjected to hunting for human consumption;
- Farmed game, i.e., farmed ratites and farmed land mammals;
- Small wild game, i.e., free wild birds and free lagomorphs; and
- Large wild game, i.e., free wild land mammals.

The Regulation (EC) No. 853/2004 (EU, 2004) also defines fresh meat as all meats that have not undergone any preserving process, apart from chilling, freezing, or quick-freezing, including meat that is vacuum-wrapped or wrapped in a controlled atmosphere. Fresh meat includes the meat coming from the carcass of an animal, as well as its offal. The term offal refers to fresh meat other than that of the carcass, including viscera and blood, and viscera means the organs of the thoracic, abdominal, and pelvic cavities, as well as the trachea and esophagus, and, in birds, the crop.

However, food scientists provide a different definition of meat. They consider meat exclusively the muscular mass and all the connected edible tissues of animal carcasses, whereas offal is classified into three categories: offal (liver, kidneys, spleen, brain, lungs, and heart), sweetbreads (pancreas, thymus, and salivary glands), and tripes (stomach and pre-stomachs of ruminants and the upper part of the small intestine).

Such discrepancies in defining fresh meat are due to the difference in purpose of the Regulation (EC) No. 853/2004 (EU, 2004) from that of scientists. The focus of the Regulation (EC) No. 853/2004 is to lay down specific hygiene rules for the hygiene of foodstuffs, whereas the focus of scientists is to give meat a scientific or commodity definition.

Regulation (EC) No. 853/2004 (EU, 2004) also defines meat products as: processed products resulting from the processing of meat or from the further processing of such processed products so that the cut surface shows that the product no longer has the characteristics of fresh meat. Italian meat products are internationally called cold cuts, processed meat products, dry-cured meats, and ripened meats; however, within the country, they are typically called *salumi*. They can be classified in whole anatomical cuts (raw/cooked and smoked/not smoked) or comminuted products (raw/cooked, fermented/not fermented, or smoked/not smoked). The latter are obtained by mixing comminuted meat, at different particle sizes, with ground lard and other pig fat; incorporating salt, sugar, spices, or seasoning; and stuffing into natural or artificial casings.

What is meat for the Italian consumers?

A questionnaire survey to assess what Italian consumers consider as meat was recently collected. Participants ($N = 611$) were from different areas of the national territory and were ≥ 15 yr of age (Figure 1).

The first question was “What is meat for you?” and provided two options: 1) Skeletal muscle and its associated tissues; or 2) All the edible parts of the animals, offal included. Surprisingly, the choice was not clearly oriented toward one definition, as 61% of participants chose Option 2 and 39% chose Option 1 (Figure 2).

When asked if they consider meat to include aquatic species (fish, crustaceans, and mollusks), frog legs, and land snails, 61% answered yes and 39% answered no. This highlights the consumer uncertainty in what exactly meat is (Figure 3). Of the 61% of the respondents who considered meat to include aquatic species, frog legs, fish, land snails, crustaceans, and mollusks were considered meat at 64, 61, 34, 30, and 25%, respectively (Figure 4).

Considering the high popularity in consumption of processed meat products (*salumi*) in Italy, another question that was addressed was if consumers consider processed meat products to be meat. Ninety-five percent of consumers responded that they consider processed meat products to be meat (Figure 5).

However, in Italy, there exists a large variety of processed meat products. Some processed meat products are slightly processed (i.e., sausages, brined beef tongue, brined or marinated meat, and stuffed pig trotter) while others are moderately processed (comminuted, stuffed, and cooked meat, i.e., *mortadella*) or processed with a long ripening time (comminuted, raw, stuffed, and fermented meat—i.e., *salami*; meat products obtained from a whole anatomical cut, that could be raw, i.e., dry-cured ham, or cooked, i.e., ham, and even smoked, i.e., *speck* and bacon).

Due to this wide range of processed meat types, the 95% who considered processed meat products to be meat were asked to specify which processed meat products they considered to be meat.

Of the 95% of the respondents who said they consider processed meat products to be meat, sausages, whole anatomical cut, stuffed pig trotter, brined or marinated meat, *salami* (comminuted, raw, and fermented), *mortadella* (comminuted and cooked), bacon, and brined beef tongue were considered meat at 82, 81, 72, 71, 68, 65, 59, and 53%, respectively (Figure 6).

The least recognized as meat among the list of processed meat products was the brined beef tongue (53%), and this may be due to the fact that most consumers do not understand what tissue(s) it is made of (muscular organ covered by a thin mucous membrane) or due to extreme consumer dislike.

Importance of Traditional Italian Meats and Meat Products

Italy is where valuable indigenous cattle breeds are produced for consumption, where unconventional fresh meat products are consumed (white veal, horse, rabbit, and quail meat), and where traditional meat products are made and commonly consumed. The following subsections are intended to give an overview of these traditional meats and meat products.

Meat from indigenous cattle breeds

Since ancient times, Italian indigenous cattle breeds have been linked to the Italian culture and tradition. Their production plays a key role both for people within their territories and for economic sustainability. The

Age of the participants

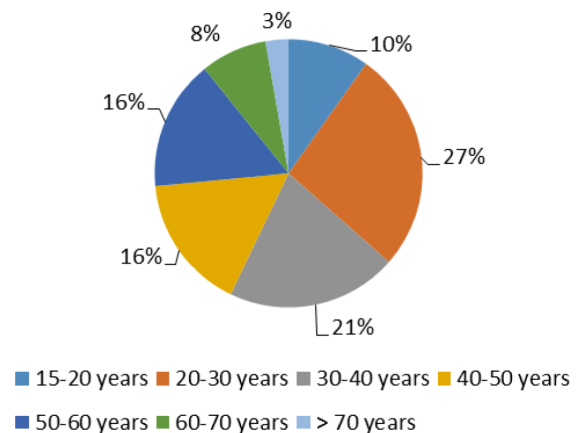


Figure 1. Distribution of age of survey participants.

What is meat for you?

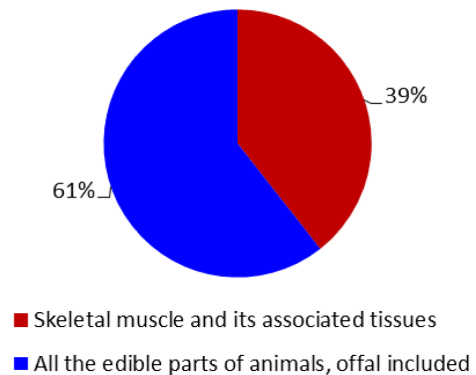


Figure 2. Distribution of participant response to the question, “What is meat for you?”

Do you consider meat also aquatic species, frogs and land snails?

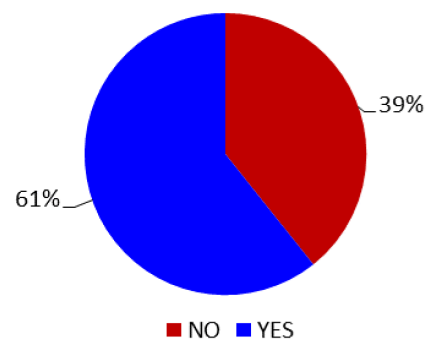


Figure 3. Distribution of participant response to the question, “Do you also consider seafood, frogs, and land snails as meat?”

Which edible products do you consider meat? (61% of the respondents)

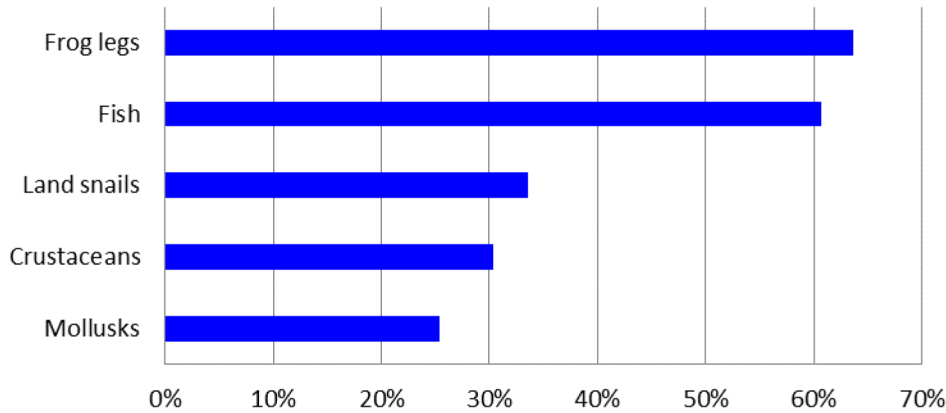


Figure 4. Questionnaire survey to Italian consumers: “Which edible products do you consider meat?” (61% of the respondents).

Do you consider meat also the processed meat products?

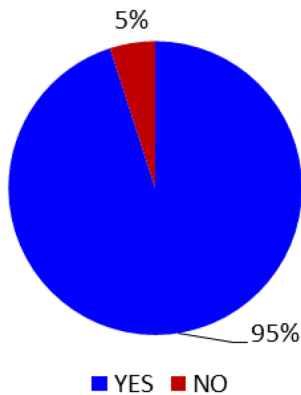


Figure 5. Questionnaire survey to Italian consumers: “Do you consider meat to include processed meat products?”

Which processed meat products do you consider meat?

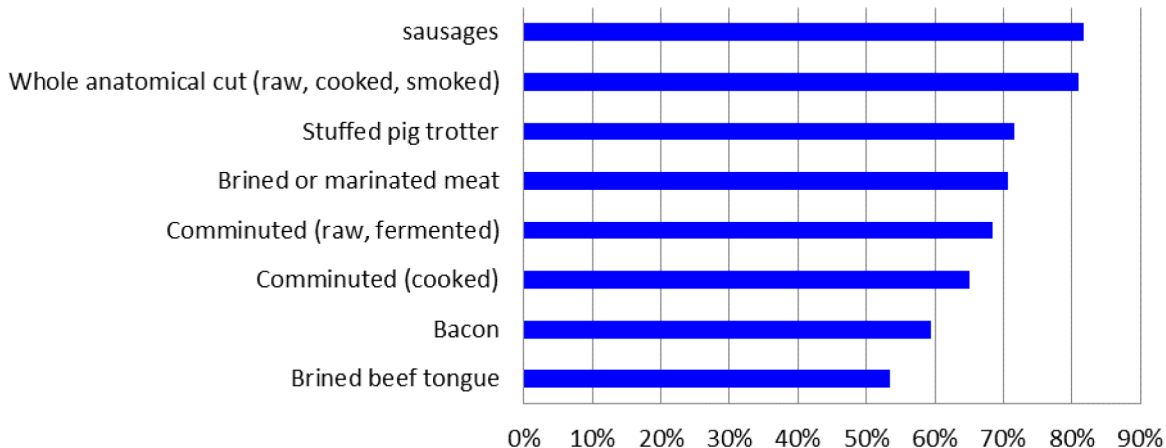


Figure 6. Questionnaire survey to Italian consumers: “Which processed meat products do you consider meat?” (95% of the respondents).

most relevant Italian indigenous cattle breeds are: Piemontese, Chianina, Romagnola, and Marchigiana.

The Piemontese breed originated from the Piemonte Region, in northwestern Italy, and it is the most numerous Italian cattle breed. Piemontese is highly specialized for beef production thanks to the double-muscled phenotype, due to a specific mutation in the myostatin gene. The meat is characterized by a light red color, high tenderness, very low intramuscular fat and cholesterol content, and a healthy fatty acid profile (Brugiapaglia et al., 2014).

Chianina, Marchigiana, and Romagnola breeds are predominantly found in central Italy. They are characterized by excellent productive and reproductive traits, together with an exceptional meat quality. For this reason and thanks to a remarkable adaptability to different environments, purebreds and crossbreds are now successfully farmed worldwide (Feliuss et al., 2014).

Among these, Chianina is probably the most famous of the above-mentioned breeds: it has 22 centuries of history, and it is easily recognizable for its somatic gigantism, being considered the largest and heaviest cattle breed in the world (Bigi and Zanon, 2008). Moreover, its meat has become famous worldwide for the *Bistecca alla Fiorentina*, which is a sizable cut of steak deriving from the loin, which has a “T” shaped bone: the fillet on one side and the sirloin on the other one. The meat is tender and flavorful, and the steaks are at least 3-cm (1.2-inch) thick and can easily exceed 900 g (2 lb) each (Pintus, 2007).

The meat of Piemontese, Chianina, Marchigiana, and Romagnola cattle breeds have been certified for authenticity and protected with certification schemes (see description below) by the European Union (*Vitelloni Piemontesi della Coscia* for Piemontese breed, and *Vitellone bianco dell’Appennino centrale* for Chianina, Marchigiana, and Romagnola breeds).



Figure 7. Frayed raw and dried horse meat (Sfilacci) (source: A. Dalle Zotte).



Figure 8. Stewed horse meat (source: A. Dalle Zotte).

Unconventional meats

Veal calf meat. Veal is a significant meat source of substantial value in Italy, which is ranked as the third European veal-producing country (Chever et al., 2014). In 2014, veal calves represented 26% of the cattle herd slaughtered in Italy and contributed for 13% to the total beef production (Brugiapaglia et al., 2016).

The veal industry is an important side market of the dairy industry and involves male calves. They are typically fed with a milk replacer supplemented by small amounts of roughage until slaughter (26–28 wk), in accordance with the EU directives that lay down minimum standards for the protection of calves (European Council, 1997 and 2008). Thanks to this peculiar feeding strategy, the resulting meat is characterized by a pale pink color (which is due to the low content of myoglobin in the muscle), high tenderness, and mild flavor, which is particularly appreciated by Italian consumers who consider white veal meat a healthier alternative to other types of meat (Chever et al., 2014).

Horse meat. Horse meat consumption is popular in Italy; however, regional differences exist both in consumption and in traditional culinary recipes, which include raw-frayed (reduction to extremely thin stripes parallel to muscle fiber direction), and dried meat (*sfilacci*; Figure 7), stewed meat (Figure 8), or meat stuffed into casings. Horse meat is traditionally sold in equine butcheries (Figure 9); however, it is now widely available in all butcheries and supermarkets. The Italian production of meat-type horses (mainly from heavy draft breeds) does not provide for the country's consumption of horse meat. Italy is the Number 1 importer of horse meat worldwide, with 24,696 tonnes in 2013 (FAOSTAT, 2017). Although data exist on the nutritional value of horse meat (Lorenzo et al., 2014) as well as the worldwide production and marketing (FAOSTAT, 2017), little information on horse meat consumption within Italy is available. Data from 2015 estimate consumption of 0.32 kg horse meat/per capita/year (Russo et al., 2017).

Rabbit meat. The consumption and trade of the European rabbit (*Oryctolagus cuniculus*) meat dates back to the Roman Empire, when Varro (116 to 27 BC) described that rabbits were kept in stone-walled pens or parks with other wild species kept for hunting purposes (Lebas et al., 1997). Since the 1970s,

several genetic (hybrid lines), feeding (pelleted diets), and technical improvements (cycled production) have made Italy the second-highest producer of rabbit meat worldwide (Dalle Zotte, 2014). This has played an important part in the national economy. In fact, Italian gastronomy includes several traditional rabbit meat-based dishes whose preparation is still generally linked to special events and to specific regions. Consequently, rabbit meat is still mainly sold as whole carcass (Figure 10) or main cuts and its real consumption represents only a small fraction (0.291 kg/per capita/year) of the 38.6 kg of total meat/per capita/year (Russo et al., 2017). Rabbit meat consumption is decreasing (-6% for the period 2010–2015; Russo et al., 2017) due to several reasons: high price, welfare issues, socio-cultural reasons, almost absent marketing strategies, and limited convenience of rabbit meat products, despite its delicate flavor, marked tenderness, and excellent nutritive and dietetic properties (Hernández and Dalle Zotte, 2010).

Quail meat. Historically, in Italy, quails have been almost exclusively intended as game birds. However, since the second half of the 20th century, quail meat has become popular in many restaurants. This as well as an increase in demand for quail meat by Italian consumers has created a niche market. This trend has resulted in the development of several intensive quail farms, mainly located in the northern-central part of Italy. Farmers have started breeding quails (*Coturnix coturnix japonica*) to improve their productive performance (Quaja Veneta, personal communication). Italy is the third-highest European producer of quail meat, after Spain and France (UNAITALIA, personal communication). Italian production reached a peak of about 24 million quails in 2004, but since then, it has been in constant decline until 2016 when production accounted for about 13 million quail (ISTAT, 2017). Quail meat production is mainly destined for the domestic market where it is sold as whole carcass (Figure 10) and dissected breasts and legs.

Meat products

Meat products are traditionally and routinely consumed in Italy, and in 2015, real consumption accounted for about 8 kg/per capita/year (ASSICA, 2015), which represented 20.7% of the total real meat consumption (Russo et al., 2017).



Figure 9. Horse meat (courtesy of macelleria Binotto Rino, Montebelluna; source: A. Dalle Zotte).



Figure 10. Unconventional meats from rabbits and quails, sold in Italian butcheries and food shops (courtesy of macelleria Binotto Rino, Montebelluna; source: A. Dalle Zotte).

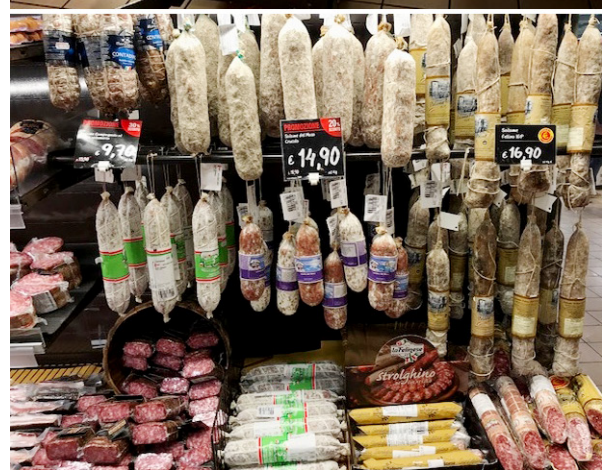


Figure 11. Variety of Italian meat products sold in Italian salumerie and food shops (source: A. Dalle Zotte).

The first meat products originated in prehistory to preserve meat through drying, salting, and smoking. However, it was in the Etruscan-Roman period (fifth century BC to sixth century AD) that the first preserved wild boar and pork legs, as well as matured and cured meat products, were produced for both self-consumption and commerce (ASSICA, 2011). Such products gained commercial importance until, in the 19th century, the first shops (*salumerie*) spread through Italy and modern processing and preservation methods were developed (IVSI, 2017). Since then, a wide variety of Italian meat products have been manufactured (Figure 11), ranging from the most popular dry-cured ham (Figure 12), to the most imitated and, unfortunately, misused *mortadella* (Figure 13), to the less known meat products with local names (*speck*, *soprèssa*, *porchetta*, and *bresaola*).

Many Italian meats and meat products have been certified for authenticity and then protected with quality schemes by the European Union



Figure 12. Sliced Italian dry-cured ham (courtesy of Attilio Fontana Prosciutti, Montagnana).



Figure 13. Mortadella Bologna PGI (source: A. Dalle Zotte).

(see below). At present, Italian meat products contribute for about one-third of the European meat products heritage (IVSI, 2017).

Certification Schemes to protect authenticity and typicality of Italian meat and meat products

Many Italian meats and meat products follow the EU regulation on quality schemes for agricultural products and foodstuffs [Regulation (EU) No. 1151/2012 (EU, 2002)]. Based on this, they are certified for Protected Designation of Origin (PDO) or Protected Geographical Indication (PGI). Each PDO and PGI product must follow strict requirements indicated in a document called the Certification Scheme. A Certification Scheme guarantees product authenticity in terms of regional origin; therefore, it has a specific link with the territory (higher for PDO than for PGI). The PDO and PGI products can be easily recognized by consumers through two quality logos (Figure 14), which can be found on the product packaging. They are intended to be both a marketing tool and a legal protection against imitation or misuse of the product name. The PDO covers meat and meat products that are produced, processed, and prepared in a specific geographical area using recognized production procedures. In this case, specific characteristics/qualities of the product must be exclusively related to the geographical area (both natural and human factors) of production. The PGI refers to meat and meat products in which at least one of



Figure 14. Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) quality logos of the EU regulation (No. 1151/2012).

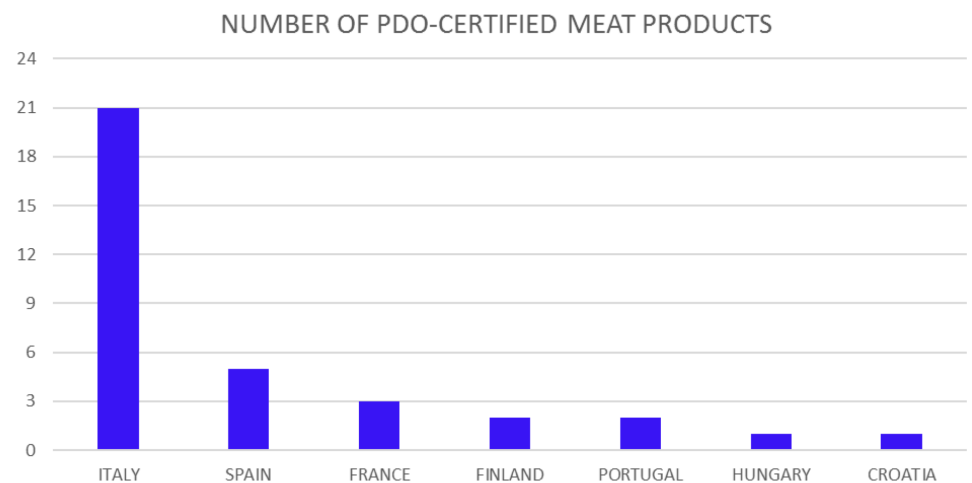


Figure 15. Ranking order of the number of PDO-certified meat products (source: abstracted from DOOR European Commission, 2017; <http://ec.europa.eu/agriculture/quality/door/list.html>).



Figure 16. Sopressa Vicentina PDO (source: A. Dalle Zotte).

the stages of production, processing or preparation, takes place in a specific geographical area. As a result of the number and variety of meat products produced in Italy, it is ranked Number 1 in the EU for PDO-certified meat products (Figure 15).

The registered Italian PDO quality scheme includes a total of one meat (from *Cinta Senese* pig breed) and 21 meat products, whereas the PGI quality scheme covers five meats (from indigenous cattle breeds—*Vitellone bianco dell'Appennino centrale*, and *Vitelloni Piemontesi della Coscia*; and from lamb—*Agnello di Sardegna*, *Agnello del Centro Italia*, and *Abbacchio Romano*) and 20 meat products.

The majority of the registered PDO and PGI Italian meat products traditionally come from pigs and are traded and consumed within the domestic market (i.e., *Sopressa Vicentina* PDO, see Figure 16, and *Prosciutto Veneto Berico-Euganeo* PDO, see Figure 17). Only a few of them are distributed worldwide (i.e., two dry-cured hams—*Prosciutto di Parma* PDO, *Prosciutto San Daniele* PDO—*Mortadella Bologna* PGI, and *Speck Alto Adige* PGI).

Italian PDO dry-cured hams are obtained from the hind leg of heavy pigs (Italian Large White, Landrace, and Duroc breeds). Hind legs are processed with sea salt, only, and ripened for a period that is generally not shorter than 13 mo. Italian PDO dry-cured hams are characterized by a high nutritional value and digestibility and recommended for any kind of dietary regimen.

Sopressa Vicentina PDO is a meat product made of the best pork cuts and fat from pigs reared in the specific geographical area, indicated within the Certification Scheme. The pork and fat are ground and mixed with spices (optional inclusion of native starter cultures), stuffed into natural casings, and ripened for a period whose duration depends on product size. *Sopressa Vicentina* PDO has a spicy odor, a delicate and slightly sweet taste, pink-red color, medium-coarse grain, and it is easy to chew (DOOR, 2017b).

Mortadella Bologna PGI (Figure 13) is made with high quality pork meat and throat fat, separately processed (lean and fat lines, respectively), and unified to obtain a cut surface that is uniformly pink (from lean line) with visible and well-distributed white fat cubes (from fat line). The odor is typically aromatic, with a delicate taste and with no perception of smoked flavor. *Speck Alto Adige* PGI is derived from a high quality, deboned, hind leg meat of a pig; dried-salted and spiced, cold-smoked, and ripened for a period that depends on the initial weight.



Figure 17. Long-ripening stage of PDO dry-cured hams “Prosciutto Veneto Berico-Euganeo” (courtesy of Attilio Fontana Prosciutti, Montagnana).

Conclusions

Even though the question, “What is meat in Italy?” was expected to have a simple and direct answer, it is clear, by this review, the answer is much more complex. Centuries of different cultures and traditions, as well as peculiar climate and geographical features, have all contributed to a great diversification of meat and meat products. This diversification has led to an extremely heterogeneous definition of meat.

Acknowledgments

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Left: Variety of Italian meat products sold in Italian salumeria and food shops (source: A. Dalle Zotte).

About the Authors

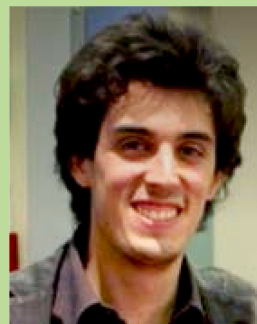


Antonella Dalle Zotte is professor of Animal Science in the Department of Animal Medicine, Production, and Health at the University of Padova, Italy. She has graduated with degrees in Agricultural Sciences with an Animal Science specialization. She completed her Ph.D. on the study of biological, zootechnical, and technological factors that affect the carcass and meat quality in the rabbit and has been granted a 1-yr post-doc at INRA (Toulouse, France). In 2011, she was awarded *Doctor honoris causa* by the Kaposvár University (Kaposvár, Hungary). She is responsible for teaching general and advanced courses in animal production, rabbit and poultry farming, and meat science and technology. Her current research focuses on ante-, peri-, and post-mortem factors that affect live performances, meat quality, and shelf life in rabbit, poultry, and fish species. She is author or co-author of about 300 articles and conference presentations, 90 of them are peer-reviewed and Scopus-indexed articles (Scopus ID: 6603007504), with six reviews, and one book chapter. She has contributed 15 invited presentations to international audiences. For the last 20 years, she has been contributing to the increase in understanding of the rabbit and poultry meat quality. **Correspondence:** antonella.dallezotte@unipd.it



Alberto Brugiapaglia graduated with a M.Sc. degree in Agricultural Sciences with specialization in Animal Production and obtained a Ph.D. on meat sensory evaluation from the University of Torino, Italy. He performed postdoctoral research on meat quality from double-muscled cattle. Since 1988, he has been associated with the Department of Agricultural, Forest, and Food Sciences of the University of Torino where he was promoted to assistant professor and then to associate professor. He was among the founders of the Italian

Association of Meat Tasters. His main research interests focus on the effects of genetic and environmental factors on carcass composition and meat quality, with emphasis on meat color and tenderness.



Marco Cullere is a post-doc researcher in the Department of Animal Medicine, Production, and Health (University of Padova, Italy). He graduated in Animal Science and completed his Ph.D. on the study of meat and meat products from unconventional meat species. Research topics include genetic, feeding, and post-mortem strategies to improve the quality of meat and meat products from poultry, rabbit, and other alternative species. From 2015, he has been working on the use of insects as an alternative feed ingredient for poultry and rabbit diets. He has been the author or co-author of 47 publications, 24 of which are peer-reviewed articles (Scopus ID: 55356322100).