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Consumer perceptions and behaviours regarding traditional pork products from agroforestry pigs in Veneto region (north-east Italy)

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Abstract: Outdoor free-range pig production is rare in the Veneto region of Italy and where it exists it is mainly linked to organic farming. Farmers who use agroforestry systems for pig production often process a large proportion of meat on-farm and they expect to receive a premium price from consumers for products such as traditional fermented salami. In order to understand consumer perceptions and behaviours towards agroforestry pigs, an investigation was undertaken which involved 387 consumers associated with nine local fair-trade groups that usually purchase products directly from farms. Although this sample does not represent all consumers, it provides information about consumers choosing “environment-friendly agriculture” such as organic or agroforestry systems. Questionnaires composed of 12 specific multiple choice questions plus questions, for example, regarding age, activity, education, and income were completed by consumers who had just seen a brief presentation on the main benefits of agroforestry systems for environment, pig welfare and product quality.

Preliminary results indicated that the majority of respondents (74%) knew little about the positive effects of agroforestry. Nevertheless they were interested in the capacity of trees to reduce nutrient leaching in the soil and water (67%), increase carbon storage (43%) and improve pig welfare (37%). Agroforestry applied in an organic farming context appeared to be more valuable than agroforestry applied with conventional agriculture. People who had already eaten farmhouse fresh pork and processed salami from outdoor free-range organic system thought that the quality is better than similar factory-produced products available in conventional retail shops and supermarkets. A majority of them (68%) believed that higher quality traits depend mainly on breed, feeding and processing techniques, whilst 23% thought that quality was linked to the presence of trees, improved welfare, and a “natural” environment.

Three main consumer groups were identified in terms of the responses to premium prices. A majority (54%) was unwilling to pay a higher price, a second group (34%) was willing to pay an additional 10-15%, and only 12% were willing to pay a premium of 20-25%. Answers about the premium price are not surprising considering the high price of farmhouse organic salami which costs about 30-50% more than similar organic products in a specialised retail shop. However, a small premium price (10-15%) could be achieved by farmers who promote organic agroforestry systems for fattening pigs if combined with an appropriate information campaign for targeted consumers.

Keywords: consumers, agroforestry, pigs, salami

1. Introduction

Farm pork processing and salami production have a long history as traditional Italian agricultural activities (Grazia et al., 2011) to supply food for family use or for sale in local markets. Although pig production intensification and new hygiene rules covering processing have negatively affected traditional production, recently there has been an increased market demand for farmhouse salami. In the Veneto area in North East Italy, farm pork processing and salami production have been increasing steadily in the last fifteen years. This production is mainly associated with multi-functionality farm activities such as agri-tourism including the development of restaurants and farm shops. More recently a Regional law (DGRV n. 1070/2015) has supported an earlier initiative to promote conservation of traditional farmhouse food processing and redefined indications and procedures for farm product processing (such has salami, honey, vegetables, and bread) under the control of a local health authority. As regards pork, each farm can process a maximum of 30 fattened heavy pigs (that have to be grown and fattened on farm) during the cold season (from November to February) according to traditional practice. In the Veneto area, there are fermented salamis and not-fermented salamis (made with a single anatomic cut of meat such as neck region, in the "*ossocollo*"). The recipes change from one area to another, using different spices (such as black pepper, garlic, and fennel seeds) or mixes of meats (pork and sheep or pork and beef, especially in the mountain areas), or different periods for ripening and maturing.

On these farms piglets are bought at 35-50 kg from sow-farm units, normally during late winter or early spring and fed until they reach 180-200 kg or more. This takes 9-10 months depending on the breed and the feed. Pigs are kept indoors with free access to a large paddock or outdoors in a free-range system, in one or more groups, and fed *ad libitum* or restricted depending on weight. Outdoor free-range systems have become more common recently due to the lower costs for animal huts, manure management and better standards of pig welfare and with more "natural and traditional" attributes which meet general consumers' requirements. While kept outdoors, growing pigs normally use marginal or less productive areas either in lowland or low mountain valleys. The pasture often includes existing areas of bushes and trees. In designed agroforestry systems, specific trees grown for bio-energy such as poplar, black locust, or willow can be intercropped with grass or arable crops such as peas, barley, and sorghum.

There is an increasing interest in agroforestry for pig production; both conventional and organic farmers, who have participated in stakeholder workshops, are willing to establish agroforestry systems to fatten pigs (Bondesan, 2014). They have highlighted that integrating trees can improve pig welfare during hot weather (due to shade reducing temperatures and the provision of stimuli for rooting behavior), help reduce the leaching of manure nutrients and, in some cases, the trees can provide fodder (including chestnuts and acorns) in the autumn-winter months.

Perceived negative aspects of agroforestry pig production include an increased complexity of work (handling pigs, feeding management) as well as the possible interaction with wild boars (with safety risk for the products) and young tree damage (from rooting, scratching and cork baiting). Farmers, who implement agroforestry for pigs, normally expect to receive a premium price from their pork products, mainly from consumers who put specific value on "animal friendly and more sustainable agriculture" systems. However that expectation may not be achieved considering the very competitive market segmentation for "high quality" meat products and the existing stratification of protected designation of origin (PDO), protected geographic indication (PGI), and organic quality standards and labels.

Short food chains are the preferred way to sell farmhouse salami, normally through farm shops (while offering other fresh or processed products), local farmer markets, and to solidarity (or fair trade) purchasing groups (SPG). SPGs are particularly attractive to farmers because the groups can encourage production, in terms of quantity and types of salami (during processing season), they can ensure larger quantities are sold at each purchase, and they can assure purchases through the whole year. SPGs can also help consumers meet their expectations in term of ethical, environmental, and animal welfare standards, whilst providing high quality products at reasonable prices (Brunori et al., 2012; Zander et al., 2013). In the Veneto region, farmer markets have been increasing in popularity in the last five years, thanks to the work of local councils and increased consumer demand for local food (*zero km food origin*). According to Rossetto (2015) the Veneto region boasts about 80 local farmer markets with a large variability in structure, size, the number of days per week, the type of food offered and the number of farmers involved. The report indicates that more than 450 farmers are selling products through farm markets, and about 1.2 million consumers have purchased food there, with an estimated value of €15 million. The most popular products are fresh vegetables (more than 52%), while meat, processed meat (fermented salami) and cheeses reach 10-12% together. It seems more difficult to collect data from the 90 SPG who are operating in the same area; some are quite significant (more than a 100 families-participants) and dynamic (weekly ordering and requiring food delivery) whilst others are small (less than 20 families) and operate only a few times each year for specific purchases such as extra virgin olive oil, fresh meat, or wine. The total of estimated regional value of annual SPG purchases is about €5 million. It is interesting to notice that fresh vegetables still represent large part of purchases (about 60%), but fresh meat and processed salami can reach 30%; this is three times the proportion achieved through farm markets. This suggests that many consumers that choose farmhouses products buy fresh meat and salami through the SPG system.

2. Objectives and methodology

An investigation was undertaken that involved nine SPGs of average size (between 42 to 65 families) based in the Veneto area (2015), to identify the issues regarding agroforestry pig production and to find more information about niche consumer interest in pork products. A multiple choice questionnaire was completed by consumers, during the SPG general meeting, after a short presentation and discussion about different agriculture and animal production systems.

Data from the collected questionnaires were analysed in order to obtain information on consumer understanding and perceptions about the main aspects of agroforestry and related pork products (preliminary results). Further data on consumer behaviour, derived from the same SPG samples, towards fresh pork and processed salami, will be collected with feedback from farmers and suppliers at the stakeholder panel.

3. Results

A total of 403 consumers' questionnaires were collected, 387 of them were considered correctly filled in and used for data analyses. A demographic description of the analysed sample is shown in Table 1.

3.1 Attitude towards the local food chain

Of the nine SPGs, three were based in a city area (with more than 30,000 inhabitants) and the six were based in medium-small towns (with less than 10,000 inhabitants). The consumers from these two groups seemed to have similar purchase attitudes, although suburban consumers showed a higher monthly purchasing frequency of food from SPG and farm markets than people who live in rural areas (2.8 *vs* 2.3). Generally, they prefer to buy fresh vegetables, fruit, cheese, processed cereals (such as flour and rice) salami and fresh-poultry (the whole chicken) approximately once a week at a local farmer market. Selected vegetables and fruits (that are easy to preserve at room temperature in cold seasons, such as potatoes, onions, and oranges), bottles of wine, and fresh pork or beef were purchased a few times each year through a SPG. As regards fresh pork, families usually buy it from SPG during cold season, with an average of 1.6 purchases of 6.8 kg each (usually bags of fresh meat weigh 5 kg, including 4-5 different meat cuts and fresh sausages). The family food basket, from SPG or farm markets, included fermented salami (of different types, size and ageing) every two weeks (23%), once a month (27%) and few times a year (33%); 17% of consumers sampled do not buy any of them (they do not like the product or are vegetarians). Salami consumption is higher during coldest months; in winter bigger purchases are often programmed (on average 3.6 kg each) because of large variety of types available in the farm and for traditional winter dishes (such as *cotechino*, a fermented pork rind salami, to be eaten boiled). During spring-summer, salami consumption decreases, and the products are often bought at local farmer markets rather than from SPG; the average purchase is half or one piece of 0.6-0.8 kg of weight.

Table 1. Demographic characteristics of participants (total N = 387)

		Count	Proportion (%)
Age	18-30 years	32	8.3
	31-40 years	87	22.5
	41-50 years	123	31.8
	51-65 years	102	26.4
	> 66 years	43	11.1
Gender	Female	220	56.8
	Male	167	43.2
Cohabitation	Single	46	11.9
	Living with family	341	88.1
Number of person in household	1	46	11.9
	2	93	24.0
	3	136	35.1
	4	98	25.3
	5 +	14	3.6
Number of children (under 14) in household	0	122	31.5
	1	143	37.0
	2	79	20.4
	3	32	8.3
	4 +	11	2.8
Gross annual Household Income (Euro)	Below 25,000	27	7.0
	25,000-34,999	96	24.8
	35,000-49,999	144	37.2
	50,000-64,999	78	20.2
	65,000 and above	42	10.9
Education	Up to 8 years of schooling	46	11.9
	9 or 10 years of schooling	73	18.9
	13 years of schooling	182	47.0
	Higher education (university)	86	22.2
Occupation	Unskilled labour	28	7.2
	Skilled labour	96	24.8
	White-collar	81	20.9
	Self-employed	44	11.4

	Helping in family business	37	9.6
	Unemployed	25	6.5
	Retired	58	15.0
	In education	18	4.7
Area of residence	Rural	223	57.6
	Urban	164	42.4

As expected, gender and age differences were also observed as regards consumption; female and younger consumers show a lower attitude and preference for traditional salami, probably due to health reasons such as considering salami to be too fatty or salty.

3.2 Understanding of low input and organic agriculture

The majority of sampled consumers (72%) prefer local food chains, since they associate those products with positive quality traits and consider them to be fresher, less manipulated, coming from a sustainable system and reliable farmers; in addition, competitive prices may be obtained buying stock through SPGs. However, only 37% of consumers clearly understood the differences between low-input, organic and conventional systems. In fact, the majority of them seemed quite confused when other aspects of food production systems are included and discussed. The remaining 27% of sampled consumers would buy food only from organic farms, especially fresh vegetables, fruit and processed cereals; for them organic standard specifications are quite clear and well defined. The main standard of organic production of “no chemical fertilizers and pesticides use” was often mentioned as a link between safe and healthy products, and it represented a key reason in purchasing decisions.

As regards food of animal origin (fresh or processed) consumers usually perceive less differences between low-input and organic systems; it seems that concepts as “no GMO feed”, “free-range rearing” or “local breed” as well as “grazing system” acquire more importance than official standard certification and labelling. Again the sample consumers showed gaps in knowledge when items such as “type of veterinary therapy”, “animal welfare” and castration of pig males were discussed.

3.3 Understanding of the benefits of agroforestry

Agroforestry was considered a new production system by the large majority of the interviewed consumers (74%), and they were able to understand the main positive effects on environment, products and farming. Systems efficiently combining trees and crop production, or tree-shrub areas for animals, were more appreciated by the “older”, “higher educated” and “organic driven” consumers. Consumers (67%) think that the effects of trees in reducing nutrients leaching in the soil and reducing underground water contamination are “important” or “very important”; 43% of them also identified the positive impact of the carbon storage capacity, although carbon footprint in food production (carbon emissions, greenhouse effects) were unclear for the majority of consumers.

In general the consumers were less able to identify other agroforestry benefits such as the improvement of natural biodiversity, soil erosion prevention and the positive impacts on landscape views; all these claims were underlined as “less important” or “not important”. The presence of trees (including providing shade and microclimate regulation) to improve animal welfare was considered as a positive aspect (37%).

3.4 Understanding the effects of agroforestry on product quality

The large majority of consumers who appreciate fermented salami from farmhouse production have specific desires in terms of quality: good taste and flavour, general product appearance (colour, lean meat/fat rate) traditional spicy and/or recipe. The use of artificial preservatives (nitrites) or synthetic guts (from collagen preparation), which makes farmhouse salami more similar to manufacture production, were poorly perceived by organic consumers and the most traditional salami eaters. While consumers discussed the interaction between agroforestry and fattening pigs in terms of fresh pork and salami quality, we obtained a large variety of opinions.

The majority of the interviewed consumers (68%) thought that fresh pork and salami quality was most connected ("important" or "very important") to the pig breed, feedstuffs raw materials, feeding regime, and processing techniques; only 23% of the interviewed consumers considered that improved animal welfare as well as a "more natural" environment and perhaps slower growth associated with agroforestry as a positive condition significantly affecting the final product quality.

However, a large majority (81%) of consumers would prefer to buy pork meat from free range farming, because they deem that a natural fattening system could improve welfare and animal health, and may determine a better meat quality (taste, tenderness, less drip loss). Consumers identified major benefits for salami quality from agroforestry fattened pigs when the black pig breed is used and large silvo-pasturage fields with oak trees are adopted; this happen in other regions (Tuscany, Umbria) where a local pig breed "*Cinta Senese*" is becoming a sort of benchmark for this type of product.

The variability in answers makes it difficult to predict if consumers would pay a premium price for agroforestry pig products, as farmers wish. About half of the interviewed (54%) did not wish to pay a premium price, while the 34% agree to pay 10-15% more; only the remaining 12% of them could afford an extra premium of 20-25%. These results may not be surprising because agroforestry for fattening pigs in Veneto still represents a niche production system; consumers are largely unware of the system benefits for the environment and animals, and, probably, farmhouse fresh pork and salami, already have a premium price if compared with similar products from conventional retail shops, since the price is about 1.8-2.5 times more expensive.

4. Discussion

Agroforestry represents a new approach in the Veneto area, mainly characterized by large conventional and intensive crop and animal production. Certainly agroforestry seems to be suitable for small or medium size farms, organic or conventional, that are selling farmhouse fresh and processed products directly to the consumers (for example farm markets, SPGs, and agri-tourism). Although farmhouse processed salami has increased, agroforestry for free range fattening pigs is still a niche production (about 17-20 farms in the Veneto region). Undoubtedly consumers, who carefully select farm suppliers according to their ethics and food-nutrition habits, may be interested in the benefits of agroforestry. According to the results of this investigation consumers who like eating traditional farmhouse salami, as well as fresh pork, would prefer products from agroforestry fattened pigs. Nevertheless, the above-mentioned results have shown that the farmers' expectation of obtaining an extra premium price for "traditional salami from free-range agroforestry fattened pigs" seems not to be easily achievable especially because of the expensive price of these products. Probably consumers need more detailed information, for example on farm-field visits, to better understand the general benefits of agroforestry if a price premium is to be achieved.

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