Circular Economy and Sustainability

Giovanni Lagioia · Annarita Paiano · Vera Amicarelli · Teodoro Gallucci · Carlo Ingrao *Editors*

Innovation, Quality and Sustainability for a Resilient Circular Economy

The Role of Commodity Science, Volume 1

Springer

Circular Economy and Sustainability

This book series aims at exploring the rising field of Circular Economy (CE) which is rapidly gaining interest and merit from scholars, decision makers and practitioners as the global economic model to decouple economic growth and development from the consumption of finite natural resources. This field suggests that global sustainability can be achieved by adopting a set of CE principles and strategies such as design out waste, systems thinking, adoption of nature-based approaches, shift to renewable energy and materials, reclaim, retain, and restore the health of ecosystems, return recovered biological resources to the biosphere, remanufacture products or components, among others.

However, the increasing complexity of sustainability challenges has made traditional engineering, business models, economics and existing social approaches unable to successfully adopt such principles and strategies. In fact, the CE field is often viewed as a simple evolution of the concept of sustainability or as a revisiting of an old discussion on recycling and reuse of waste materials. However, a modern perception of CE at different levels (micro, meso, and macro) indicates that CE is rather a systemic tool to achieve sustainability and a new eco-effective approach of returning and maintaining waste in the production processes by closing the loop of materials. In this frame, CE and sustainability can be seen as a multidimensional concept based on a variety of scientific disciplines (e.g., engineering, economics, environmental sciences, social sciences). Nevertheless, the interconnections and synergies among the scientific disciplines have been rarely investigated in depth.

One significant goal of the book series is to study and highlight the growing theoretical links of CE and sustainability at different scales and levels, to investigate the synergies between the two concepts and to analyze and present its realization through strategies, policies, business models, entrepreneurship, financial instruments and technologies. Thus, the book series provides a new platform for CE and sustainability research and case studies and relevant scientific discussion towards new system-wide solutions.

Specific topics that fall within the scope of the series include, but are not limited to, studies that investigate the systemic, integrated approach of CE and sustainability across different levels and its expression and realization in different disciplines and fields such as business models, economics, consumer services and behaviour, the Internet of Things, product design, sustainable consumption & production, bio-economy, environmental accounting, industrial ecology, industrial symbiosis, resource recovery, ecosystem services, circular water economy, circular cities, nature-based solutions, waste management, renewable energy, circular materials, life cycle assessment, strong sustainability, and environmental education, among others.

Giovanni Lagioia • Annarita Paiano
Vera Amicarelli • Teodoro Gallucci
Carlo Ingrao
Editors

Innovation, Quality and Sustainability for a Resilient Circular Economy

The Role of Commodity Science, Volume 1

Springer

Editors
Giovanni Lagioia
Department of Economics,
Management and Business Law
University of Bari Aldo Moro
Bari, Italy

Annarita Paiano
Department of Economics,
Management and Business Law
University of Bari Aldo Moro
Bari, Italy

Vera Amicarelli
Department of Economics,
Management and Business Law
University of Bari Aldo Moro
Bari, Italy

Teodoro Gallucci
Department of Economics,
Management and Business Law
University of Bari Aldo Moro
Bari, Italy

Carlo Ingrao
Department of Economics,
Management and Business Law
University of Bari Aldo Moro
Bari, Italy

National Congress of Commodity Science
AISME 2022
Bari, Italy
2022/10/27
2022/10/28
https://www.aisme2022.it

ISSN 2731-5509 ISSN 2731-5517 (electronic)
Circular Economy and Sustainability
ISBN 978-3-031-28291-1 ISBN 978-3-031-28292-8 (eBook)
https://doi.org/10.1007/978-3-031-28292-8

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Paper in this product is recyclable.

AISME ACCADEMIA ITALIANA DI SCIENZE MERCEOLOGICHE

UniBa UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Sapere senza confini.

AISME2022

Foreword

The weaknesses of the current economic, social, and environmental scenario, together with the impact of the COVID-19 pandemic that the humankind has faced, are increasingly stimulating an in-depth reflection on the organizational models that today's society is based upon. Those are mainly related to consumers' behaviors, and to the productive models of businesses and organizations, as well as to the functioning of national and supranational socio-political systems.

Therefore, in the process of restoring stability, it is desirable that any form of circular economy (CE) system derives from the implementation of the relevant issues of sustainability, innovation, and quality not only on the scale of production but also on that of use/consumption and disposal. Here comes the Life Cycle Thinking (LCT) perspective that is based upon designing not just products, but also products' life cycles that comply with the goals and targets of sustainable development. Doing so will make it possible to satisfy CE principles and loops, and so extend products' life cycles, and close resource loops through recycling processes. This is a huge challenge that should follow an approach based on exchanging and sharing knowledge, thereby going beyond the multidisciplinary and transversal approach that has always been a classic in commodity science. The latter is aimed at collecting the homogeneous and unitary body of research fields that revolve around the production of material, food, and energy commodities. This includes the study, analysis, and evaluation of both resources and technologies used for their extraction and transformation. It is also expanded to the assessment of the consequent implications on the total quality and use value of the goods and on the external environment with which they interact, including the environmental management and certification systems.

Commodity science can play multiple relevant roles in this regard, as it is highly attached to innovation, eco-design, quality, circular economy, industrial ecology, and sustainability. All of those relevant issues and related complex problems involve a holistic system approach, regulatory aspects, and empirical knowledge, and demand the active participation of all stakeholders involved in the commodity's life cycle, including designers, technicians, practitioners, producers, company managers, and retailers. Therefore, it is recommended that the making of public decisions

for promotion of aforementioned issues is supported and informed by scientifically sound quantitative information so as to discern values from facts and to help a fair attribution of responsibility along the entire supply chain and life cycle. Under this perspective, the XXX National Congress of Commodity Science can play multiple key roles, as it created a valuable platform to share and build upon knowledge and skills in a way to strengthen the already existing links among the key actors of the world of academia and research, industry, and politics discussion and study.

Viterbo, Italy Alessandro Ruggieri

Preface

The XXX National Congress of Commodity Science was held in Bari (Italy) on 27th and 28th October 2022; it was promoted by the Italian Academy of Commodity Science (AISME) and was hosted by the Department of Economics, Management and Business Law of University of Bari Aldo Moro. Its aim was to explore the relevant quality, innovation, circularity, and sustainability issues, in an integrated and multidisciplinary approach.

The Congress collected a total of 113 contributions, which can be considered as the sign of the relevance and importance of the research themes it was conceived to address.

The Congress hosted an opening session for institutional greetings, followed by a keynote speech on sustainable innovative energy production systems and an oral section conceived to an overview of the key findings from poster-presented research. In particular, the contributions received were assigned as 21 oral presentations and 92 posters. The congress was then structured into three plenary sections (each per thematic area), chaired by spokes-professors of the Academy, to host the aforementioned oral presentations. The latter were selected in a way to:

- Make sure that the Congress could provide sector operators with methodological tools enabling understanding of the current evolutionary dynamics, particularly in innovations and quality analysis and management
- Contribute to developing new growth models and paradigms towards paths for sustainable development strategies on the micro- and macro-dimension scale in the medium-term time horizon

This year's edition of the Congress was the thirty-first, with the first being held in the early 1960s in Bari,[1] which contributes to making it an event of undoubted historical significance. In Appendix 1, the reader will find all the congress events that have been organised since then. In all of this, it must be said that the commodity

[1] "Convegno sul tema: Progresso tecnologico e miglioramento della qualità", Bari, 12–13 settembre 1962. Atti in: Quaderni di Merceologia (Bari), 1, 1, Bari, Editore Cressati.

science school of Bari is undoubtedly one of the oldest and most prestigious in Italy; it all dates back to the School of Advanced Studies of Commerce that, when founded in 1886, was the fourth in Europe. Over the course of its history spanning more than one hundred and thirty years, that school has contributed to advancing research both on the national and international level. This has been documented by a historical library with volumes dating back to the second half of the 1800s, and a commodity science museum that contains vintage equipment and materials that were used and tested for original research development.

The Congress represented a platform for the exchange of knowledge and skills in all those research development fields which commodity science has always interfaced with, giving its important contributions, including material science, energy, agriculture, engineering, business management, quality management, innovations and social equity. To that end, researchers, practitioners, managers, producers and other stakeholders were positively involved in the Congress. In particular, the Congress managed to trigger a constructive dialogue with the territory and with economic, industrial and political stakeholders on environmental, economic and social issues related to natural resource exploitation and environmental pollution. In doing so, particular attention was paid to the aspects of innovation, quality and sustainability that were assessed by congress participants, with a holistic system perspective, through application of internationally recognised scientifically based methodologies capable of implementing sustainable aims and improving the economic-environmental performances of economic activities, including Material Flow Analysis, Life Cycle Assessment (LCA) and the multi-indicator environmental footprint accounting. This will contribute to the upswing and resilience of companies and societies, despite the undeniable difficulties deriving from the pandemic, the current geopolitical upheavals and the consequent international economic crisis.

An adequate and timely transition towards a green economy could represent an important opportunity for local territories to improve their levels of quality, sustainability and competitiveness in the medium and long term. This puts emphasis on the need for economic operators to comply with the obligations required by the reference legislation in the context of transitioning to sustainable circular forms of the economy; doing so will allow them to assess the possible future implications on their business activities. This can be relevant and useful for all public and private organisations operating in various economic sectors. Furthermore, dissemination of results from the Congress can represent an important knowledge-enhancement opportunity for all those entrepreneurs and producers who intend to undertake initiatives with reduced environmental and socioeconomic impact.

In the light of this, economic operators (i.e., managers, entrepreneurship, business associations, public decision makers) and students were invited to take active part in the Congress for a profitable and mutual exchange of information on the Congress research themes. Furthermore, several business companies have supported this event; their names have been highlighted in a dedicated section in the continuation of the book.

In this context, it is worth highlighting that the Congress objectives and targets fully reflect the purpose recognised by the AISME founders of advancing and promoting commodity science development in the field of scientific and applied research and enhancing the knowledge of the whole commodity science subject and related key features, especially in the sector of public institutions. In doing so, the contributions of commodity scientists will be made increasingly available to producers and consumers as well as to the society as a whole. This can play an essential role in the implementation of technological innovation solutions for creation of production and consumption models that are urgently needed to move towards a society that respects the principles and objectives of sustainable development.

Thanks to the remarkable number of contributions and the numerous opportunities created for debating and sharing ideas, the Congress managed to address key environmental and socioeconomic issues. These can encourage good practices for implementation of circular economy models to best combine profitability with sustainable environmental management and quality of commodities.

The 113 conference papers went through a double-blind review and were put together to form this book titled *Innovation, Quality and Sustainability for a Resilient Circular Economy: The Role of Commodity Science* that is published by Springer Nature as part of the Circular Economy and Sustainability series. Considering the number of papers included and the resulting length of the book, the latter was split into Volume 1 and Volume 2, both comprising papers dealing with the most relevant and up-to-date issues of innovation, quality and sustainability in a wide range of sectors.

Under this perspective, Volume 1 explores the sectors of agriculture, biomass, foods and beverages, consumers' awareness and behaviours, digitalisation and tourism.

Volume 2, instead, investigates the waste management sector and several others related to energy, materials and transports. In addition to this, Volume 2 reviews and builds upon the general important aspects of quality, circular economy and sustainability.

Though it came to a national congress, there has been papers being contributed by authors' teams coming from European countries like Poland and Spain. Such puts emphasis upon the attention and interest that research themes like those addressed by the congress spark on the international level. Furthermore, scanning through the 113 papers, the book editors could see that research development was often taken as the occasion to strengthen ongoing collaborations both at the national and international level, and create new ones.

The collected papers explored the three themes the Congress was centred upon in a multitude of sectors. In this regard, from Fig. 1 there is evidence that "Agriculture, biomass, foods and beverages" was the most investigated one with a total of 37 papers, followed by waste management and a miscellaneous of general facts, with 14 papers each either way. Whereas, as evident from Fig. 2, the majority of the conference papers (61%) investigated circular economy and sustainability-related issues.

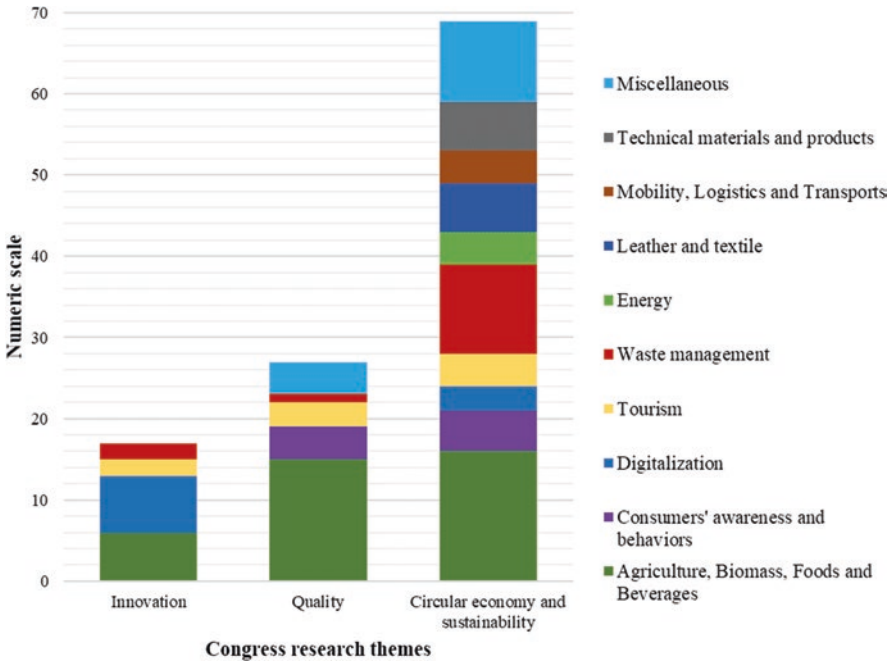

Fig. 1 Number of conference papers per thematic research area and investigated sector

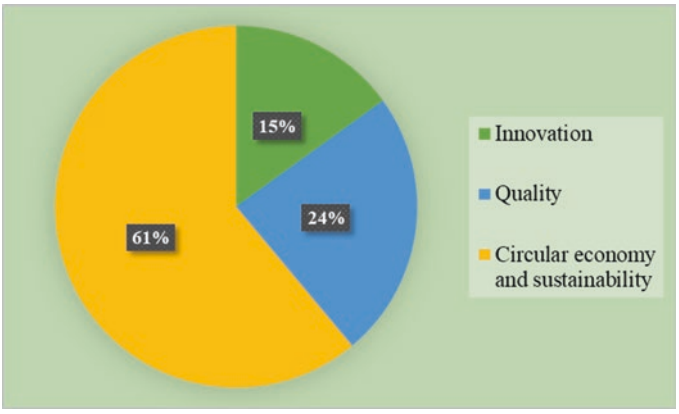

Fig. 2 Percentage distribution of the collected conference papers based upon the thematic area they have addressed

Based upon the number and quality of the contributions, it can be asserted that the Congress attained its main objectives of updating, advancing and promoting interdisciplinary research on innovation, quality, circular economy and sustainability.

The 113-paper collection is expected to make it possible for the Congress to advance knowledge on the subjects of quality of commodities and of ecological transition, with particular attention to the innovations and to the environmental and socioeconomic implications on the production, use and consumption of material and energy commodities that are currently available on the market.

Finally, findings contained in this volume will contribute to guiding public and private decision makers in the identification process of the most appropriate methods and timing in the processes of innovation for commodities' quality enhancement and of transition to a sustainable equitable efficient economy and providing economic operators with in-depth knowledge to deal more effectively and efficiently with the related implications and opportunities.

Bari, Italy

Giovanni Lagioia
Annarita Paiano
Vera Amicarelli
Teodoro Gallucci
Carlo Ingrao

Chapter 43
From Knowledge to Consumption: How Consumers Perceive Food Quality

Ilenia Bravo, Angela Carelli, Lucio Cappelli, and Patrizia Papetti

Abstract Italy is a country of great local customs and traditions, and each region has peculiar typical characteristics, which determine different qualitative, sensory, and organoleptic attributes in food products. This allows the promotion of the growth of POD- and PGI-certified brands, transforming it into an important production area of "Made in Italy" food excellence. The quality of food is linked to the sustainability of the "agri-food system," a term increasingly used in various strategic documents, policies, and development plans at the international, national, and local level: "Agenda 2030" (UN), the Common Agricultural Policy (CAP), the Green Deal, and the "Farm to Fork" strategy that represents the attention and the acquisition of greater awareness of the consumer, who wants to be informed about the origin and the nutritional composition of a food. This work investigates the behaviour of Italian consumers towards certificated products through survey administration. From the observation of the results obtained, it emerges that 90% of respondents recognize certification logos and their main differences, while food safety is chosen by 62% of consumers to represent the concept of quality.

Keywords PDO/PGI certification · Consumer perception · Sustainability · Survey

43.1 Introduction

The term "food *quality*" is widely defined by different regulations and control systems, but from the consumer's point of view, it is not so simple to define. It is linked to various components: organoleptic (flavour, texture, and visual aspect), nutritional (composition and energetic value), commercial (price and profit), technological

I. Bravo (✉) · A. Carelli · L. Cappelli · P. Papetti
Dipartimento di Economia e Giurisprudenza, Università degli Studi di Cassino e del Lazio Meridionale, Cassino, Italy
e-mail: ilenia.bravo@unicas.it

G. Lagioia et al. (eds.), *Innovation, Quality and Sustainability for a Resilient Circular Economy*, Circular Economy and Sustainability,
https://doi.org/10.1007/978-3-031-28292-8_43

(attitude to transformation), and hygienic-sanitary (healthiness). The common thought associates the quality product with a traditional product that does not have specificity, while for a *typical product*, we mean the outcome of a historical and localized process based on a combination of territorial and anthropic resources, which have a strong link with the cultural tradition and the territory of origin, which come from geographical areas, with specific raw materials and treatment processes. The elements that distinguish it are its enhancement and competitiveness in the market. The protection of geographical indications is one of the main tools used as a distinctive sign between product and territory and between diversity in the market. By regulation, we have defined two main key labels of product quality: protected designation of origin (PDO) and protected geographical indication (PGI). PDOs are products essentially due to a particular geographical environment (intrinsic natural and human factors) and whose production phases all take place in the defined geographical area, while PGI products are essentially attributable to their geographical origin and have at least one of the production stages in the defined geographical area (Behnke and Janssen, 2020; Sampalean et al. 2021). For these reasons, the PDO and PGI marks represent the compliance and compatibility requirements for a product of origin to be recognized as a food good and facilitate its access to market areas. The general objectives of European Union (EU) action concern the transition of the European agri-food sector towards a model of sustainable production and consumption; it should be economically viable, provide equitable benefits to society, and have minimal environmental impact. This objective is consistent with the results of several studies that link sustainability and healthy eating through the concept of food system, recalled by the European strategy "Farm to Fork." Sustainable food systems emphasize the role of eating styles as fundamental links between food, human health, and nutritional benefits.

According to the Institute of Services for the Agrifood Market (ISMEA) report, the economy based on the supply chain of branded products provided a contribution of 19% to the total sales in the agri-food sector. PDO and PGI brands represent 27% of the "Made in Italy" in the world, with an export growth of 5.1%. It is evident that in recent years, the awareness, perception, knowledge, and consumption of agri-food products marked by quality brands have increased among consumers. At the same time, consumer acceptance of the certified product has grown, which has been recognized as a key success factor in determining product development, orientation, and market opportunities. Singh (2019) reported that "attitude" is a learned predisposition to respond with respect to a certain object (Maxim et al. 2019). Schifferstein (2001) reported that various factors contribute to the formation of attitudes, which can be classified into consumer attributes and product attributes, such as direct observation; indirect knowledge; positive or negative opinion formed by different variables such as personality, values, risk perception, age, education, sociocultural position, culture, nationality, media exposure to information; and social support (Fishbein and Ajzen 2011; Singh 2019). In this study, we tried to define the relationship between eating habits and PDO- and PGI-branded products to investigate consumers' awareness, knowledge of geographic brand products, and interest in Italian certification food and their consumption.

43.2 Material and Methods

43.2.1 The Survey

The survey aims to examine the Italian quality certifications through the compilation of an anonymous questionnaire to understand if they are recognized by consumers, to understand how they perceive quality, what degree of judgement is attributed to them, and know their awareness at the time of purchase. The questionnaire consisted of 20 multiple choice questions distributed in virtual form, with a system of instantaneous messages multiplatform, allowing a descriptive analysis of the attention towards food-certified products and an evaluation of their performance on the market based on the choices of customers. The study was conducted on 203 respondents, all of whom were adults from urban areas with different levels of education. In fact, according to Maxim et al. (2019), the interest of consumers in certificate products is influenced by factors such as gender, age, education, and geographic origin.

The data were collected over a period of 1 year, specifically from May 2021 to June 2022, and all the answers were centralized by the research team through a sharing app, which allowed us to obtain and analyse the answers online and in real time. The data collection questionnaire was made up of four sections and was based on four main aspects: food safety and human health, knowing the meaning of certification, quality, and buying trend. The first section asked about sociodemographic characteristics, including sex, age, educational level, and environment of origin; the second section consisted of questions about the understanding of the PDO and PGI brands; the third aspect that we have considered is the security to understand what role it plays in consumer choices; and the last section regarded rapport between price and quality and the influence on purchasing choices.

43.2.2 Statistical Analysis

To provide statistical meaning to the data collected, we applied analysis of variance (ANOVA) to assess whether qualitative factors play a significant role in food purchase decisions. A multicomparison between factors' means was performed by a least significant difference (LSD) test.

43.3 Results and Discussions

43.3.1 Demographic Analysis of the Respondents

The aim of this questionnaire was to determine the opinion of consumers on the quality of certificated products, confidence about safe food, and knowledge about them. The initial phase of the survey allowed the start-up methodology for an

effective interpretation of the results according to the importance attached to certain factors (age, occupation, education level, and so on). In total, 203 people participated in this study: 43.3% were male and 56.7% were female. Participants ranged in age from 18 to over 60 years: the age group 40–49 (12.8%) and the group under 20 years old (only 7%) are the lowest representatives. These numbers and percentages are similar to those reported by Maxim et al. (2019) and Sampalean et al. (2021). Most of the consumers (68%) have higher education (degree, bachelor's, and postgraduate studies), and some students attend a university course (9.9%). All participants come from the urban environment, from all Italian regions, and the most representative are Lazio, Umbria, and Campania (as shown in Table 43.1).

43.3.2 Knowledge of European Quality Certifications

In the second section of the questionnaire, consumers were shown the EU quality logos, PDO, PGI, and organic farming logos and asked to select the ones they were familiar with. The results indicated that the most familiar logo was the PDO logo, selected by 92% of respondents, followed by the PGI logo (81%). These findings were higher than those reported in a study by Sampalean et al. (2021), where the results indicated that the logo people were more aware of the PGI, selected by 82% of respondents, followed by the PDO (76%) and the organic logo (68%). Regarding the knowledge of the PDO and PGI logos, participants were asked if they knew the meaning of the different certified products. The total number of participants in this study confirmed that they knew their meaning and difference: When asked "Do

Table 43.1 Sociodemographic characteristics

Characteristic		Respondents	
Type	Levels	Number	Percentage out of the total (203)
Age	Under 20	7	3.4
	20–29	64	31.5
	30–39	38	18.8
	40–49	26	12.8
	50–59	31	15.3
	Over 60	37	18.2
Education	High	138	68
	Middle	57	28.1
	Lower	8	3.9
Gender	Female	115	56.7
	Male	88	43.3
Area	North	22	10.8
	Centre	25	12.3
	South	25	12.4
	Lazio region	131	64.5

PGI/PODs mean the same to you?", 87.6% answered "No." For both statements that defined the PDOs out of all respondents, 42% were able to correctly identify the one that refers to "the production steps of which all take place in the defined geographical area" and 43% were able to identify "whose quality or characteristics are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors."

43.3.3 Perception, Attitudes Towards Quality Food Products, and Purchasing Habits

The results reporting respondents' opinions regarding the food safety of EU quality–certified products are detailed in Figs. 43.1 and 43.2. Food safety was used in this section as a tool to study consumers' knowledge of EU quality certifications, as these products are believed to have a higher level of food safety. When asked, nearly 90% of respondents believed that the certified product was safer, while 10.4% did not consider it to be safer than an unmarked product. To assess the relationship between safety and certification, two questions were asked, the first with a yes/no answer asking whether a certified product is considered safer than one without certification and, in the second question, to indicate a value from 1 to 10. A total of 77.2% of the population gave a rating of 8 to 10, less than 20% between 5 and 7, and only 3% a value below 5.

Thus, the relationship between quality and safety was assessed by directly questioning respondents about the perceived interrelationship. For most consumers, quality and safety are clearly related, and they pay close attention to safety and

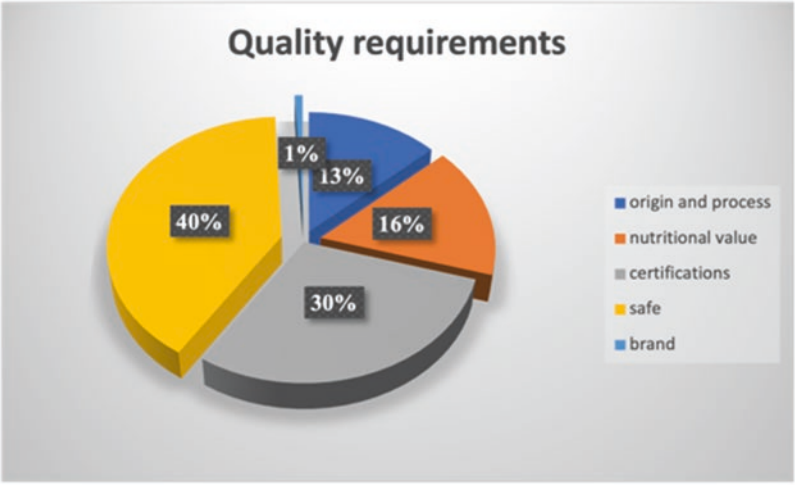

Fig. 43.1 Answers to the question "What is the important factor to define quality"

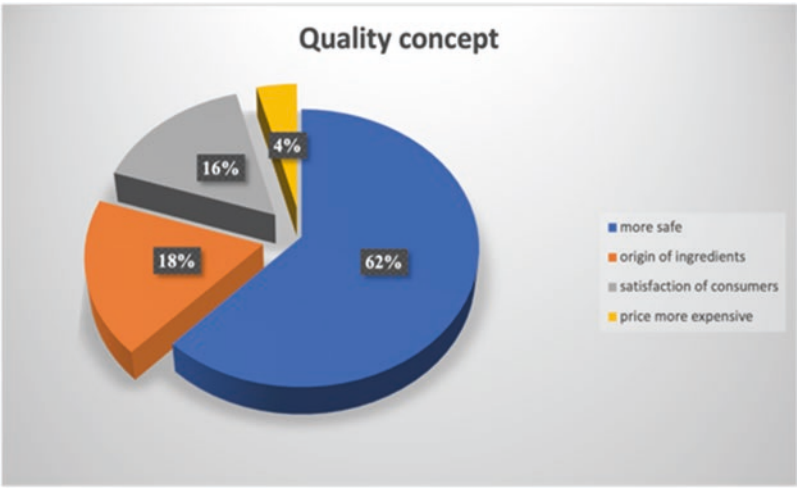

Fig. 43.2 Answers to the question "Which one is associated with the meaning of quality"

health control requirements, which are at the top of the rating scale (75%), followed by PDO/PGI certification (55%) and nutritional value (30%). In fact, possible contamination can be a source of concern, while belonging and possessing a certified label can become synonymous with food safety and guarantee protection and quality.

Questions were therefore proposed to better understand the purchase choice, or if the certification acquires an important requirement in the choice of the product. We have evaluated, with the next step, how much the price of the certified product can influence the consumer; if on the one hand 8.4% answered no, for approximately 35% certification is important but could do without it, a portion of over 56% remains, so certification takes on an important significance at the time of purchase. According to the data collected, the most reasonable purchase price they would be willing to pay is less than 5 € for 43.9% of the population, 29.9% under 10 €, 19.5% is divided between 10and 20 €, and only 6.7% over 20 €. These findings are confirmed in other work where consumers give second priority to the price of products and always seek certified foods (Batra et al. 2000; Zander and Feucht 2018; Giampietri et al. 2018; Thøgersen et al. 2019; Spognardi et al. 2021). They believe that the price of PGD/PGI foods becomes the cost of investing in "good health" (Sandalidou et al. 2002; Geeroms et al. 2008). The study findings further showed that despite having higher prices compared to conventional alternatives, many consumers continue to buy certified products.

An analysis of variance (ANOVA) was used to assess the statistically significant differences between the consumers' perception about the price and qualitative variables. A multicomparison between factors' means was performed by the least significant difference (LSD) test. For consumers' perception of the price of organic products, the parameters presented statistically significant differences ($p < 0.05$).

43.4 Conclusions and Future Perspectives

Italy is one of the European countries that has always supported policies of recognition and institutionalization of geographical denominations to protect territory and food production based on great agro-biodiversity and sociocultural knowledge and traditions. On these assumptions, we carried out this investigation to understand the key factors that guide purchasing decisions and promote consumer confidence and the variables that influence the consumption of certified foods based on sociodemographic characteristics (age and level of education) and economic evaluations. Indeed, the questionnaire revealed that the questions were well designed for the participants and provided clear and useful information.

Of course, a limitation of our study is that the sample is not statistically representative of the Italian population and appears biased towards relatively younger and highly educated buyers and consumers, although in agreement with other research. The data collected showed that consumers are increasingly attentive to labels, nutritional values, geographical origins, and information on traceability. The interest and awareness of certified foods have grown, as evidenced by the high percentage of knowledge on quality and certification systems, which are perceived as healthier and safer than conventional alternatives. It emerges that the guarantee of product safety and quality strengthens consumer confidence. These results can be practical input to follow to increase the production, marketing, and promotion of certified food products at national and international levels, even if a policy is needed that guarantees the POD and PGI brands and invests in agriculture and livestock to guarantee food safety and sustainability, aid farmers and producers, and support their local economies. Therefore, it is necessary to conduct further research with a larger and more representative sample to extend and generalize the results to represent the national population through the development and improvement of methods that better capture the real behaviour of consumers in different experimental contexts.

References

Batra R, Ramaswamy V, Alden D et al (2000) Effects of brand local and nonlocal origin on consumer attitudes in developing countries. J Consum Psychol 9:83–95

Behnke K, Janssen M (2020) Boundary conditions for traceability in food supply chains using blockchain technology. Int J Inf Manag 52:101969

Fishbein M, Ajzen I (2011) Predicting and changing behavior: the reasoned action approach. Psychology Press, New York

Geeroms N, Verbeke W, Van Kenhove P (2008) Consumers' health-related motive orientations and ready meal consumption behaviour. Appetite 51(3):704–712

Giampietri E, Verneau F, Giudice TD, Carfora V, Finco AA (2018) Theory of planned behaviour perspective for investigating the role of trust in consumer purchasing decision related to short food supply chains. Food Qual Prefer 64:160–166

Maxim C, Farcas A, Vodnar D et al (2019) Consumers' requirements for functional foods. Bull UASVM 76(2):138–144

Sampalean NI, Rama D, Visentin G (2021) An investigation into Italian consumers' awareness, perception, knowledge of European Union quality certifications, and consumption of agrifood products carrying those certifications. Biobased Appl Econ 10:35–49
Sandalidou E, Baourakis G, Siskos Y (2002) Customers' perspectives on the quality of organic olive oil in Greece: A satisfaction evaluation approach. Br Food J 104(3/4/5):391–406
Schifferstein HN (2001) Effects of product beliefs on product perception and liking. In: Frewer LJ (ed) Food, people and society. Springer, Berlin/Heidelberg, pp 73–96
Singh DP (2019) Consumer attitudes to functional foods. In: Reference module in food science. Elsevier, Amsterdam
Spognardi S, Vistocco D et al (2021) Impact of organic and "protected designation of origin" labels in the perception of olive oil sensory quality. Br Food J 123:2641–2669
Thøgersen J, Pedersen S, Aschemann-Witzel J (2019) The impact of organic certification and country of origin on consumer food choice in developed and emerging economies. Food Qual Prefer 72:10–30
Zander K, Feucht Y (2018) Consumers' willingness to pay for sustainable seafood made in Europe. J Int Food Agribus Mark 30:251–275