ISSN 1120-1770

ITALIAN JOURNAL OF FOOD SCIENCE

Rivista italiana di scienza degli alimenti

Volume XXVI
Number 4
2014

CHIRIOTTI EDITORI

ITALIAN JOURNAL OF FOOD SCIENCE
(RIVISTA ITALIANA DI SCIENZA DEGLI ALIMENTI) 2nd series

Founded By Paolo Fantozzi under the aeges of the University of Perugia
Official Journal of the Italian Society of Food Science and Technology
Società Italiana di Scienze e Tecnologie Alimentari (S.I.S.T.Al)
Initially supported in part by the Italian Research Council (CNR) - Rome - Italy
Recognised as a "Journal of High Cultural Level"
by the Ministry of Cultural Heritage - Rome - Italy

Editor-in-Chief:
Paolo Fantozzi - Dipartimento di Scienze Economico-Estimative e degli Alimenti, Università di Perugia, S. Costanzo, I-06126 Perugia, Italy - Tel. +39 075 5857910 - Telefax +39 075 5857939-5857943 - e-mail: paolo.fantozzi@unipg.it

Co-Editors:
Gallina Toschi Tullia - Alma Mater Studiorum - Università di Bologna, e-mail: tullia.gallinatoschi@unibo.it
Mannino Saverio - Università degli Studi di Milano, e-mail: saverio.mannino@unimi.it
Pittia Paola - Università degli Studi di Teramo, e-mail: ppittia@unite.it
Pompei Carlo - Università degli Studi di Milano, e-mail: carlo.pompei@unimi.it
Rolle Luca - Università degli Studi di Torino, e-mail: luca.rolle@unito.it
Sinigaglia Milena - SIMTREA - Università degli Studi di Foggia, e-mail: m.sinigaglia@unifg.it

Publisher:
Alberto Chiriotti - Chiriotti Editori srl, Viale Rimembranza 60, I-10064 Pinerolo, Italy - Tel. +39 0121 393127 - Fax +39 0121 794480 e-mail: alberto@chiriottieditori.it - URL: www.chiriottieditori.it

Aim: The Italian Journal of Food Science is an international journal publishing original, basic and applied papers, reviews, short communications, surveys and opinions on food science and technology with specific reference to the Mediterranean Region. Its expanded scope includes food production, food engineering, food management, food quality, shelf-life, consumer acceptance of foodstuffs. food safety and nutrition, and environmental aspects of food processing.
Reviews and surveys on specific topics relevant to the advance of the Mediterranean food industry are particularly welcome.
Upon request and free of charge, announcements of congresses, presentations of research institutes, books and proceedings may also be published in a special "News" section.

Review Policy:
The Co-Editors with the Editor-in-Chief will select submitted manuscripts in relationship to their innovative and original content. Referees will be selected from the Advisory Board and/or qualified Italian or foreign scientists. Acceptance of a paper rests with the referees.

Frequency: Quarterly - One volume in four issues. Guide for Authors is published in each number and annual indices are published in number 4 of each volume.

Impact Factor: 5-Year Impact Factor: 0.489 published in 2013 Journal of Citation Reports, Institute for Scientific Information; Index Copernicus Journal Master List 2009 (ICV): 13.19
IJFS is abstracted/indexed in: Chemical Abstracts Service (USA); Foods Adlibra Publ. (USA); Gialine - Ensia (F); Institut Information Sci. Acad. Sciences (Russia); Institute for Scientific Information; CurrentContents®/AB&ES; SciSearch® (USA-GB); Int. Food Information Service - IFIS (D); Int. Food Information Service - IFIS (UK); EBSCO Publishing; Index Copernicus Journal Master List (PL).

IJFS has a page charge of € 25.00 each page.

Subscription Rate: IJFS is available on-line in PDF format only.
2014: Volume XXV: PDF for tablet € 60.50 (VAT included) - Supporting € 1,210.00 (VAT included)

ITALIAN JOURNAL OF FOOD SCIENCE

ADVISORY BOARD

SCIENTISTS

R. Amarowicz
Editor-in-Chief
Polish J. Food and Nutrition Sci.
Olsztyn, Poland

A. Bertrand
Institut d'Oenologie
Université de Bordeaux
Talence Cedex, France

L.B. Bullerman
Dept. of Food Science and Technology
University of Nebraska-Lincoln
Lincoln, NE, USA

F. Devlieghere
Dept. Food Technology
and Nutrition Faculty of Agricultural
and Applied Biological Sciences Gent University
Gent, Belgium

S. Garattini
Ist. di Ricerche
Farmacologiche "Mario Negri"
Milano, Italy

J.W. King
Dept. Chemical Engineering University
of Arkansas Fayetteville,
AR, USA

T.P. Labuza
Dept. of Food and Nutritional Sciences
University of Minnesota
St. Paul, MN, USA

A. Leclerc
Institut Pasteur
Paris, France

C. Lee
Dept. of Food Science
and Technology Cornell University,
Geneva, NY, USA

G. Mazza
Agriculture and Agri-Food Canada
Pacific Agri-Food Research Centre
Summerland, BC, Canada

J. O'Brien
Head, Quality and Safety Dept.
Nestle Research Centre
Lausanne, Switzerland

J. Piggott
Departamento de Alimentos e Nutrição
Universidade Estadual Paulista
Araraquara, Brasil

J. Samelis
Dairy Research Institute
National Agricultural Research Foundation
Ioannina, Greece

M. Suman
Food Research
Lab Barilla C.R. F.lli spa
Parma, Italy

M. Tsimidou
School of Chemistry,
Artisotle University
Thessaloniki, Greece

Prof. Emeritus J.R. Whitaker
Dept. of Food Science and Technology
University of California
Davis, CA, USA

REPRESENTATIVES of CONTRIBUTORS

R. Coppola
Dipartimento di Scienze
e Tecnologie Agroalimentari e Microbiologiche
(DI.S.T.A.A.M.), Università del Molise,
Campobasso, Italy

M. Fontana
Soremartec Italia, Ferrero Group
Alba, Italy

V. Gerbi
Dipartimento di Valorizzazione
e Protezione delle Risorse Agroforestali (DI.VA.P.R.A.)
Sezione Microbiologia ed Industrie Agrarie,
Università di Torino, Torino, Italy

S. Porretta
Associazione Italiana
di Tecnologie Alimentari (AITA)
Milano, Italy

M. Rossi
DeFENS, Department of Food, Environmental and
Nutritional Sciences
Università di Milano, Milano, Italy

DOES SMART AGRICULTURE GO DOWNSTREAM IN THE SUPPLY CHAIN?

T.F.M. CHANG*, M. DROLI and L. ISEPPI
University of Udine, Department of Civil Engineering and Architecture, Section of Economics and Landscape, Via delle Scienze 206, 33100 Udine, Italy
*Corresponding author: chang@uniud.it

ABSTRACT

Nowadays it seems to be imperative for smart farms to go downstream in the Supply Chain (SC) to supplement the revenues of their underlying product sales. Using the well-structured database of Eurostat Supply tables for EU-27, this study intends to verify what products the Agricultural sector is offering beyond its core business activity to diversify its portfolio. The findings demonstrate that Agriculture is going downstream in the SC, predominantly moving towards its traditional activities: food processing, agro-tourism, and recreation. Green energy is the newcomer. Smart farmers should innovate in the mainstream of their secondary activities, using the leverage of lucrative activities and rethinking their vertical integration.

- Keywords: agricultural portfolio diversification, farmer choices, supply chain, growth and share matrix, supply tables, secondary production -

INTRODUCTION

Research on Food Supply Chain (FSC) entails various difficulties. Prevailing among these is the quantification of the production value obtained by agriculture from outside its core activities, such as from: food processing, accommodation and food services, wholesale and retail, and other services. These concerns are general problems that likewise involve every other industry. When evaluations are done, they often appear to be very partial (being limited to a specific product e.g. an organic one), unstructured (e.g. applying un-standardised and non-homologated classifications), and suffering from duplication (e.g. the turnover from direct sales which is already included in the value of primary agricultural materials, as noted in KEAFSEY *et al.* (2013). What is needed, therefore, is the provision of a complete, standardised and certified database, without any duplication, specifically such as the one described hereafter. Over the last 5 years, Eurostat has disseminated a new set of input-output tables, named Supply and Use, in conformity with NACE and CPA classifications within the framework of the ESA-95 system, and harmonised with the UN-System of National Accounts and the ISIC classification (EUROSTAT, 2008). In this database, the Supply table provides the value of core business production for each industry, as well as of secondary productions that are, in the main, core competences of other sectors. Contextually, the Supply table provides the value of a group of homogeneous products (e.g. Agricultural products) supplied to the economy as a whole by each sector, broken down by the industries that deliver it as a principal product. Two annual time series have been utilised: the first encompasses the 2000-2007 period, and was compiled using the NACE rev. 1.1 classification, while the second has recently been published (in 2013) according to the NACE rev. 2 classifications, and contains EU-27 and EA-17 tables for 2008-2009, as well as with data limited to 12 EU countries for 2010. This study utilises the first series for an inter-temporal comparison (2000-2007), and the second series for an up-to-date evaluation relating to the last available year (2009).

The study objectives are as follows: 1) to quantify the value of activities included in the Agriculture portfolio that are classified by Eurostat as primary and secondary production, which pertain to the core business of other industries; 2) to create a Boston Consulting Group (BCG) Growth-Share Matrix in order to verify farmers' choices and expectations regarding downstream paths of diversification in the FSC (HENDERSON, 1970); and 3) to evaluate the difficulties facing Agriculture in its attempt to diversify its portfolio, and offer suggestions about potential opportunities in this regard.

MATERIALS AND METHODS

This study utilises the EU-27 Supply matrixes that reflect the primary characterising and secondary non-characterising production activities of industries. Generally, survey results mainly concern enterprises with numerous secondary activities, and it is the principal activity of an enterprise that determines its allocation to a specific industry classification. The columns of the Supply matrix present the production program for each industry, including the output of its primary and secondary productions. For each bundle of products listed in the rows (following CPA classifications), it is possible to find the industries that produce those goods as their primary or secondary production listed in the columns. The principal activity or production of an industry is reported on the diagonal of the Supply matrix while secondary activities are listed off the diagonal (EUROSTAT 2008).

For the period 2000-2007, the European tables, published up to 2012, were using the NACE rev 1.1 Classification of Economic Activities. Until 2004 the geographical reference was EU-15 countries, and EU-25 or EU-27 thereafter. The national accounts domain as a whole has implemented the NACE rev 2. Classification of Economic Activities (harmonised with UN ISIC rev. 4), and has applied this since the 2008 reference year. The latest input-output tables were published in 2013, and concern the 2008 and 2009 years for EU-27 and EA-17 countries. These tables have been built on the basis of the new industry classification.

The first part of this study refers to the activities (included in the NACE rev.2 classification under Section A, Division 01) denoted as "Crop and animal production, hunting, and related service activities", which encompass seven groups, articulated as follows: 01.1 Growing of non-perennial crops; 01.2 Growing of perennial crops; 01.3 Plant propagation; 01.4 Animal production; 01.5 Mixed farming; 01.6 Support activities to agriculture and post-harvest crop activities; and 01.7 Hunting, trapping, and related service activities. These groups are then further articulated in 25 classes (EUROSTAT, 2008a). Secondary activities/productions are all those which are not included in the above definitions, and which are appropriately classified under other industries/groups of products, according to the same NACE rev. 2/CPA classification.

After having calculated the economic importance of primary and secondary Agriculture production for EU-27 (2009), articulated by the core competences of industrial sectors, the methodology of BCG has been applied. This last consists of the construction of a Growth-Share Matrix (GSM), modified appropriately for the purposes of this study. For EU-27 in the 2000-2007 period (adopting the old NACE rev. 1.1 classification), the compound growth rate of each ex-

tra-agricultural production (y-axis of the GSM graph), as well as the logarithm of its share (in %) of agricultural secondary production (x-axis of the GSM graph), has been calculated for 2007. This is an alternative application of GSM, since the aim is to establish the position of agricultural secondary activities in the farmers' portfolio rather than their competitive position in the destination market. However, the results obtained have allowed the classification of Agricultural secondary production under the 4 classical typologies from left to right on the graph, being: a) 'Stars', which are fast-growing investments by Agriculture outside its core business which have a high impact on its secondary activities. A star might only be cash-neutral, despite its strong position. Large amounts of investment may be required to defend their position against competitors; b) 'Question Marks' are fast-growing investments with low share of Agricultural secondary production. Substantial net cash input is required to maintain or increase their production share; c) 'Cash cows', that have a high secondary production share, but are slow growing. These should generate substantial cash inflows ready for use in other investments; and d) 'Dogs', that are secondary productions with low production share and slow-growing investments which generally regard mature product in the final phase of life-cycle. These investments tend to have a negative cash flow, which is likely to continue. However, these typologies are only the result of past investment trends by Agriculture in specific extra-agricultural activities. They do not provide indications of a farms' capability to successfully develop new strategic paths for further downstream diversification in its portfolio of secondary products in the FSC. To overcome difficulties, there is a need for the height of the entry barriers in the destination markets to be determined through specific indexes that are described below. In the literature there are other barrier indexes, but these are not suitable for the purposes of this study (ORR, 1974; MANN, 1966). The originality of the Chang indices (compare CHANG and ISEPPI, 2012) is essentially that: (i) each industry/country is compared using a reference system of economic or geographical average behaviour; (ii) the symmetry is fundamental: it considers both the insulation ability of each sector in building up entry barriers, and the invasion ability of other sectors to enter the core business area of the reference industry; and (iii) it also highlights the balance between the performance of entry barriers and the invasion ability. These indices have been applied in order to determine whether the markets of industries into which Agriculture is entering and hoping to expand market share have high or low entry barriers that prevent or allow penetration. These indices allow for both an ordering among individual sectors and individual countries, and for the investigated phenomena to be measured. For each country (and for the complex of countries), the Supply matrix is taken by product and by industry. For a given industry i (n is their number), P_i denotes the proper production (namely the production in the industries' primary field of competence), S_i represents the industries' secondary production in all the remaining group of products, and A_i is the total secondary production of all the other industries involved in the core business of the given industry i. It is necessary to normalise the indexes, specifically:

p_i is P_i normalised by $\sum_{j=1}^{n} Aj$ (1)

$a_i = A_i$ normalised by $\sum_{j=1}^{n} Pj$ (2)

$s_i = S_i$ normalised by $\sum_{j=1}^{n} Sj = \sum_{j=1}^{n} Aj$ (3)

The first index is the Chang Entry Barrier Index:

$$\Phi_i = \frac{\lg \frac{a_i}{p_i}}{1 + \left| \lg \frac{a_i}{p_i} \right|} \quad (4)$$

The value ranges from -1 to +1. If $a_i = 0$, no penetration happens, hence the index attains the maximum +1. The minimum -1 represents a theoretical case limit in which the entire production of an industrial sector is the secondary of the other sectors.

The second index is the Chang Invasion Index.

$$\sum_{j=1}^{n} Pj$$

This compares the differences between external secondary activities and internal (incoming) secondary activities, and normalises them with the whole of the balance of secondary activities for all the sectors.

The Chang Invasion Index is:

$$I_i = \frac{(n+1)(S_i - A_i)}{\left(\sum_{i=1}^{n} |Sj - Aj| \right) + n|S_i + A_i|} \quad (5)$$

(refer also to index 13 in CHANG and ISEPPI, 2011). The index ranges from -1 to 1.

"Of course negative values mean that the invasion undergone by the industry is greater than the penetration it performs, 0 (zero) means balance, positive values mean that it expands more than it is invaded. Thus the index is not only connected to entry barriers, but also tied to the capability or interest to overcome the entry barriers of other sectors" (CHANG and ISEPPI, 2012).

RESULTS

In the EU-27 whole economy (2009), total domestic production at basic prices amounts to €22,028.66 billion. Adding imports of €1,465.66 billion and Direct purchases made abroad by residents, and Subtracting the Cif/fob adjustments on imports, it is possible to obtain a figure for EU total supply of goods and services of €23,649.94 billion, including exports. In respect to domestic production, the percentage share of primary production, corresponding to the sum of core business activity of every industry, accounts for 92.6% of the total production, with a total value of €20,398.84 billion. EU-27 Secondary production amounts to only €1,629.82 billion, corresponding to 7.4%.

In this context, the industry named by NACE rev. 2 as "Crop and animal production, hunting, and related service activities" (hereafter Agriculture) has a total production of €350.42 billion, of which €327.16 billion pertains to primary production (93.36%), and €23.25 billion (6.64%) to secondary production. As can be seen, the incidence of primary production of the Agricultural Industry is above the EU average (93.36% *vs.* 92.6% respectively), whilst the contrary is the case for secondary production (6.64% *vs.* 7.4% respectively). This implies that Agriculture is less able and capable to undertake activities outside of its core business than the mean for the economy as a whole. At the same time, the group of products (CPA), named Products of agriculture, hunting, and related services (hereafter Agricultural Production), derives its total production from the activities of both Agriculture and all other industries. The value at basic prices of agricultural products produced by other industries amounts to only €3.36 billion, being only 1.02%, of total Agricultural production, whilst Agriculture produces the overriding part (98.98% *vs.* 92.60% of the whole economy production). This is a clear signal that agricultural activity is very difficult to undertake, and that exogenous and endogenous barriers to entry in the agricultural core business are very high. In synthesis, EU Agriculture has the potential to enter the field of primary activity of other industries, but until now it has not even been able to achieve the average share of diversification of the economy as a whole. In the meantime, the above result demonstrates that entering farming's core business is very hard for most firms.

Regarding the diversification of the Agricultural industry, ten groups of products absorb the major part of its efforts, considering those that furnish at least 1% of its secondary production (Table 1). These product groups represent 94.8% of Agriculture secondary production, whilst the remaining 55 groups of products together represent only 5.2%.

The principal fields of secondary activity in EU-27 Agriculture are Food, beverages, and tobacco products, whose value in this field are worth €15.83 billion, being about 68.1% of farmers' total Secondary production. This is a signal that European farms are pursuing an obsolete model of downstream vertical integration, already dismissed by the same manufacturers who now identify the most lucrative downstream activities specifically as services provision rather than transformation of raw materials such as agriculture. This is the profit imperative! (WISE and BAUMGARTNER, 1999).

Table 1 - Agricultural Industry Secondary and Primary Production in the Supply Chain (EU-27, 2009).

No	Code	Secondary Products (CPA) of Agricultural Industry	Million of Euro	% Share
5	CPA_C10-C12	Food products, beverages and tobacco products	15,830	68.08
36	CPA_I	Accommodation and food services	1,265	5.44
27	CPA_F	Constructions and construction works	1,178	5.07
51	CPA_N77	Rental and leasing services	981	4.22
29	CPA_G46	Wholesale trade services, except of motor vehicles and motorcycles	967	4.16
31	CPA_H49	Land transport services and transport services via pipelines	461	1.98
60	CPA_R93	Sporting services and amusement and recreation services	424	1.82
54	CPA_N80-N82	Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services	367	1.58
24	CPA_D35	Electricity, gas, steam and air-conditioning	339	1.46
40	CPA_J62_J63	Computer programming, consultancy and related services; information services	226	0.97
		Agricultural Industry main fields of activities	**22,038**	94.78
		Other industries < 1% on the Total	1,214	5.22
		Total Secondary Production	**23,252**	100.0
		Principal Production	**327,163**	
		Total production of Agricultural Industry	350,415	

Moreover, Agriculture performs downward vertical integration with some service activities, but only marginally, and only in the fields in which it has some sort of traditional experience either in a conservative frame or in up-to-date evolution. These activities are: Accommodation and food services; Rental and leasing services; Wholesale trade services; Land transport services and transport services via pipelines; Sporting services and amusement and recreation services; Security and investigation services; Services to buildings and landscape; Office administrative, office support and other business support services; and Computer programming, consultancy and related services and information services. Construction and construction works are also in the experiential tradition of agriculture, while the activity of Electricity, gas, steam, and air-conditioning is a newer field of activity, encouraged by strong incentives for Green Energy.

This is the state-of-the-arts Agriculture Portfolio. The above reported activities, considering that farmers are mainly conservators, are expected to be considered for further expansion, although the effects of the economic crisis has lead to a general contraction that may upset current trends. There are, however, also innovators among farmers who are considering going deeper into the SC downstream. Like smart manufacturers, they may create new business models to capture profits at the end of the value chain, and to provide steady service-revenue by processing, packaging, and marketing commodities and service (Piccinini *et al.*, 2015). This would allow them to capture a larger share of income in subsequent phases of SC (HOLLAND and BRUCH, 2010). From the classification of the Growth and Share Matrix built on EU-27 figures for Agriculture in the 2000-2007 period, the composition of its Secondary production portfolio results in Fig. 1:

1 - the Food and beverages industry is the main source of cash flows, having been classified as a Cash Cow, while still having great potential as a Star. It is a safe investment, although it is growing to a lesser extent than other secondary activities of Agriculture. On the other hand, its cash flow can provide funds for further investments, such as in the areas of quality wines for direct sale, and of luxury farmhouses for rural tourism (RIZZO and GIUDICE, 2013). It also appears (Table 2) that the "Food and beverages" industry has medium-high barriers to entry but this notwithstanding, it is being invaded by other industries. The reason could be that this industry is heterogeneous and, especially in the field of experience goods, niches arise in its market. This is the case with the invasion of Agriculture and its quality wines and olive oils;

2 - Land transports, Real Estate and Other Services are Dogs that Agriculture is now reducing in its investment plan. Although these are markets with low barriers to entry and are sub-

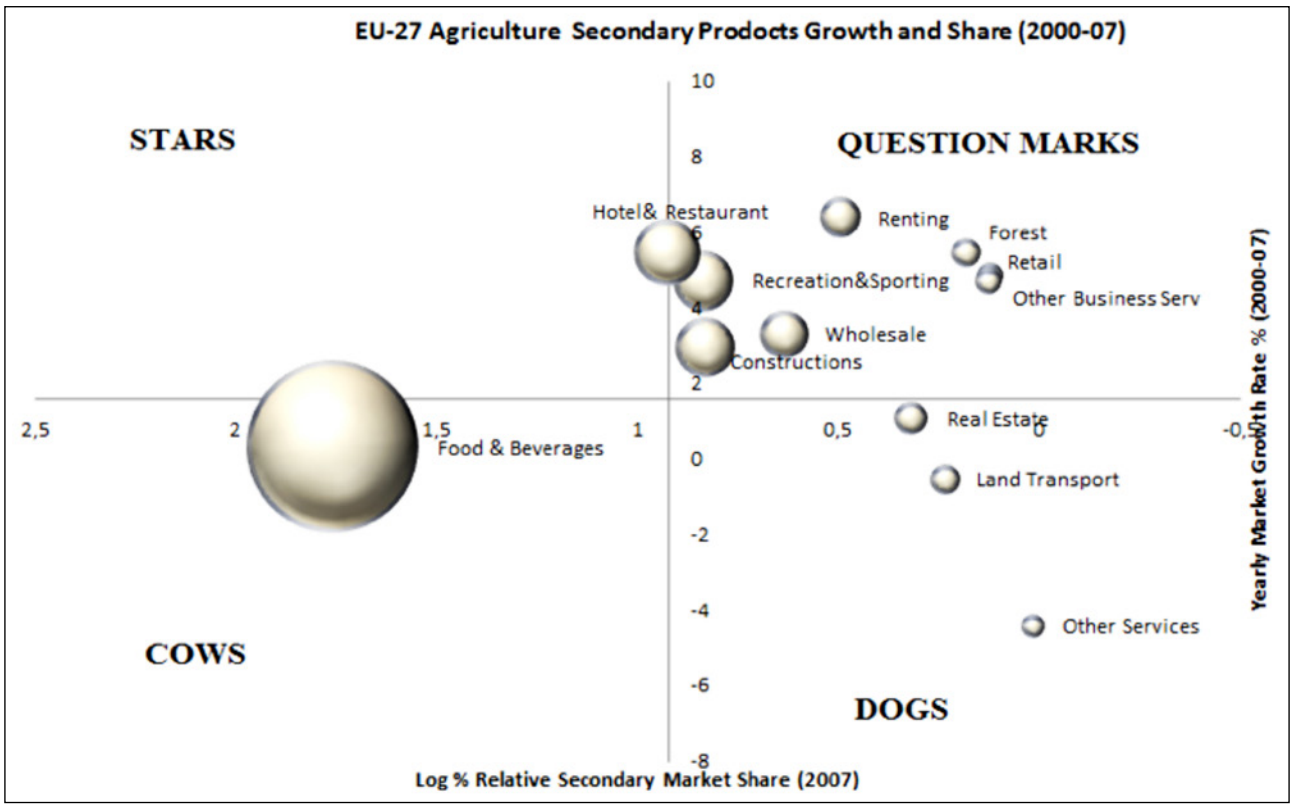

Fig. 1 - Growth and Share Matrix of Secondary Production of EU-27Agriculture (2000-07). Source: Authors' elaboration on Eurostat data.

Table 2 - Classification of the markets in which EU Agriculture performs its Secondary production.
Source: Authors' elaboration on Eurostat data.

Industries/Groups of products	Chang Entry Barriers Index	Position of Barriers in the EU Economy Ranking (Quartile)	Chang Invasion Index	Position as Invader in the EU Economy Ranking (Quartile)	Classification	
					Barriers	Capacity to Invade/ Being invaded
Products of agriculture, hunting and related services	45	I	47	I	Very High	Strong Invader
Electrical energy, gas, steam and hot water	39	I	52	I	Very High	Strong Invader
Construction work	22	II	-12	IV	High	Heavily invaded
Recreational, cultural and sporting services	21	II	33	I	Medium High	Strong Invader
Products of forestry, logging and related services	18	II	2	III	Medium High	Invaded
Food products and beverages	15	II	-4	III	Medium High	Invaded
Real estate services	0	II	-65	IV	Medium Low	Heavily invaded
Hotel and restaurant services	-3	III	-28	IV	Medium Low	Heavily invaded
Land transport; transport via pipeline services	-7	III	-4	III	Low	Invaded
Retail trade services, except of motor vehicles	-10	III	21	III	Low	Invader
Other business services	-18	III	-52	IV	Low	Heavily invaded
Wholesale trade and commission trade services	-27	IV	-3	III	Very Low	Invaded
Other services	-33	IV	-43	IV	Very Low	Heavily invaded
Renting services of machinery and equipment	-40	IV	-65	IV	Very Low	Heavily invaded

ject to being invaded (the former) or heavily invaded (the other two) by new entrants (Table 2), these activities proceed at much lower costs because they are operated by well-structured consolidated incumbents;

3 - there are no activities in Stars for which Agriculture should aim to find more Cash Cows to be milked for future investments;

4 - Question marks are numerous, namely the investments made by agriculture to diversify its portfolio of assets, which are growing at a rate higher than average and represent a real opportunity, albeit at different levels of development and portfolio share. Those which deserve to be examined for their relevance are Hotel and Restaurant (HOTREST) and Recreational, cultural and sporting services (RECREAT) which are on the borderline of being Stars as they are the most dynamic in terms of growth, and it is upon these that EU agriculture focuses its investments. HOTREST has low entrance barriers and a very high predisposition to be invaded; in consequence, Agriculture should have no problems to further expand its sphere of influence in rural tourism. RECREAT has, on the contrary, high barriers to entry and is an invader of other activities, but Agriculture has the means to circumvent these barriers since it possesses land and infrastructures to develop this type of activities (CHANG *et al.*, 2013). Among the other Question marks, namely Rental, Wholesale, Construction, Retail, Forest, and Other business services, only the first two have resisted the economic crisis to remain among the Question marks, while all the others have slipped down into the Dogs' domain. The "real estate bubble" has negatively affected some secondary activities of Agriculture because they do not have enough market share to face, through economies of scale, the challenge of the incumbent crisis. From 2007 to 2009, the number of Question marks dropped from 9 to 5, and this has frozen some agricultural expectations.

CONCLUSIONS

The managerial implications of this study are the following: firstly, it confirms the idea that entering farming's core business could be very hard for newcomers. In a stagnant market, high entry barriers and stability may influence firms, helping them to adopt a long-term viewpoint. This is the strategic element required to optimise rents deriving from firms' market share (RUMELT and WENSLEY, 1981; WERNERFELT, 1982). Secondly, it emerges that EU Agriculture has below average capabilities to engage in activities outside of its core business area. Consequently, specific measures aimed at empowering ancillary businesses should be adopted. This could be done by, for example, empowering internal operations with the implementation of pre and post-sales of in-farm services in order to familiarise and raise

awareness of new clients about its products, and deepen their knowledge of existing product-users respectively.

The final consideration is that if farms, particularly small and medium-sized, want to develop the scope of their direct sales in Retail, they must lean on Food, Hotels and Restaurants, and Recreational Activities, to create integrated projects to exploit their structures and take advantage of the conveyance of clients in proximity to wine and agro-tourism farms and to recreational estates. For example, the structures needed for the direct sale of goods and services require minimal investment and light facilities, and may become customer attractors. An empowered attractor can be an event marketing centred in rural areas, representing a fusion of the four groups: food & wine goods and services, entertainment, and retail trade. This has the advantage of concentrating the commitment of the farmers on the non-agricultural field in a short time, and of bringing a number of new potential customers. As McLuhan says in regards to these events, 'the medium is the message itself'; that is to say, the public essentially requires choral participation, and at the same time creates business (MCLUHAN, 1964).

The previous analysis indicates that farms, although following a traditional downstream model of vertical integration, may innovate along new paths in the mainstream of their secondary activities. Transactional resources such as inter-firm trade contacts (DROLI *et al.*, 2013) could help Agriculture to leverage highly lucrative markets in its portfolio such as Food, Hotels, Restaurants, and Recreational activities, to set up, plan, and organise productive business alliances (cooperation in competitive markets, partnership-based objectives, etc.).

This study does not intend to push the analysis beyond the important aspect of cash flows. Rather, it creates the necessary framework to make future investigation possible.

ACKNOWLEDGEMENTS

The authors wish to thank Livio C. Piccinini for methodological suggestions and helpful comments and Sandro Clocchiatti for the collaboration in the construction of the 27 EU countries complex database.

REFERENCES

Chang T.F.M. and Iseppi L. 2011. Specialisation versus Diversification in EU Economies: a Challenge for Agro-food? Transition Studies Review", 18-1:16-37.

Chang T.F.M. and Iseppi L. 2012. EU Agro-Food Chain and Vertical Integration Potentiality: a Strategy for Diversification? Transition Studies Review, 19-1:107-130.

Chang T.F.M., Droli M., Iseppi L. 2015. Extra-core production and capabilities: where is the Food Industry going?, International Food and Agribusiness Management Review, February.

Chang T.F.M., Piccinini L.C., Iseppi L. and Lepellere M.A. 2013. The black box of economic interdependence in the process of structural change. EU and EA on the stage, Italian Journal of Pure and Applied Mathematics, n. 31-285-306.

Droli M., Chang T.F.M., Iseppi L and Piccinini L.C. 2014. Managing trade contacts in HotRest intermediate markets: a resource-based view analysis in EU countries, Tourism Economics, August, 20, 4 - 757-778.

Eurostat 2008. Eurostat Manual of Supply, Use and Input-Output Tables, Eurostat Methodologies and working papers (Luxembourg).

Henderson B.D., 1970. Perspectives on the Product Portfolio, Boston Consulting Group.

Kneafsey M., Venn L., Schmutz U., Balázs B., Trenchard L., Eyden-Wood T., Bos E., Sutton G. and Blackett M. 2013. Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, European Commission, Joint Research Centre (Provisional Version).

Mann H.M. 1966. Seller concentration, barriers to entry, and rates of return in thirty industries, 1950–1960. Rev Econ Stat 48-3:296-307.

McLuhan M., 1964. Understanding Media: The Extensions of Man. McGraw-Hill.

Orr D. 1974. An index of entry barriers and its application to the market structure performance relationship. J Ind Econ 23–1:39–49.

Piccinini L.C., Chang T.F.M., Iseppi L. 2015. From the short supply chain to the smart chain, Italian Journal of Food Science, n. 1.

Piccinini L.C., Lepellere M.A., Chang T.F.M., Iseppi L. 2014. Partitioned Frames in Discrete Bak Sneppen Models, Italian Journal of Pure and Applied Mathematics, n. 33 December.

Rizzo M. and Giudice V. L. 2013. Structural analysis of forms of local partnership in the Val d'Anapo area. Quality - Access to Success 14:188-193 (SUPPL. 1).

Rumelt R. P. and Wensley R., 1981. In search of the market share effect. Proc. 41st Meeting of the Academy of Management, San Diego, Cal.: Academy of Management.

Wernerfelt B., 1982. The relation between market share and profitability: an attempted synthesis. Working Paper No. 306, The University of Michigan.

Wise R. and Baumgartner P., 1999. Go Downstream: The New Profit Imperative in Manufacturing. Harvard Business Review 77-133-141, September-October.

Paper received January 15, 2014 Accepted March 21, 2014

PREVIEW ON VOLUME XXVII No. 1, 2015

REVIEW

Biodegradable packaging and Edible Coating for fresh-cut fruits and vegetables
F. Galgano, N. Condelli, F. Favati, V. Di Bianco, G. Perretti and M.C. Caruso

PAPERS

Comparison of Knowledge in the Field of Nutritional Fats Among Students
S. Onacik-Gür, A. Żbikowska and M. Kowalska

Turkish Consumer Decisions Affecting Ice Cream Consumption
Y. Topcu

Technological and Sensory Properties of Hamburgers Enriched with Calcium. Study of the *in vitro* Bioavailability
A.M. Soto, M. Luisa García and M. Dolores Selgas

Optimization of Microwave and Air Drying Conditions of Quince (*Cydonia Oblonga*, Miller) Using Response Surface Methodology
C. Baltacıoğlu, N. Uslu and M.M. Özcan

Se Effect on Biological Activity of *Flammulina Velutipes*
I. Milovanović, T. Stanojković, M. Stajić, J. Vukojević and A. Knežević

The Physicochemical Properties of Edible Protein Films
Seda Dursun and Nuray Erkan

Spectrophotometric Determination of Trace Quantities of Cadmium in Seafood Samples by Simultaneous Cloud Point Extraction and Ternary Ion Association System
Sh. Nekouei and F. Nekouei

A Comparative Study on Fatty Acid Content of Main Organs and Lipid Classes of Land Smails *Assyriella Escheriana* and *Assyriella Guttata* Distribuited in Southeastern Anatolia
İ. Ekin

SHORT COMMUNICATION

Effects of Nutritional Elements Level on Nutritional Characters and Phytochemistry of Strawberry in Hydroculture
R. Asghari

SURVEYS

Socio-Economic Assessment of Direct Sales in Sicilian Farms
S. Tudisca, A.M. Di Trapani, F. Sgroi and R. Testa

Aanalysis of a Direct Selling Network for Agrifood Products
P. Rapisarda, M. Rizz and A. Scuderi

End of the Derogations to Regulation (EC) 853/2004 for Cow's MILK in Italy
G. Bolzoni, A. Marcolini and E. Buffoli

AUTHOR INDEX

VOLUME XXVI (2014)

Name	Page
Acar-Soykut E.	308
Adamo P.	390
Addis M.	134
Ademola S.K.	221
Ajibola T.B.	221
Akhavan Sepahi A.	349
Al-Ruquie I.M.	62
Alamri M.S.	62
Alfa M.	41
Ali Tarighat Esfanjani	169
Allegra V.	343
Altay Dede N.	308
Amarowicz R.	127
Amendola D.	252
An L.	109
Anastasio A.	390
Arduzlar Kagan D.	268
Attouchi M.	390
Balla S.	317
Bañón S.	289
Baron M.	317
Baudino C.	74
Bedia M.	289
Bellia C.	443
Berardinelli A.	190
Biel W.	203
Bilancia M.T.	176
Borrello S.	116
Boyacioglu D.	268
Calvo S.	420
Caponio F.	176
Caracciolo F.	81
Carta D.	91
Casolani N.	153
Catillo G.	134
Cattaneo S.	197
Cavani C.	412
Chang T.F.M.	451
Chavan U.D.	127
Cheli F.	91
Chen Hai-Hua	300
Chinnici G.	329
Chirollo C.	390
Cieslik E.	275
Ćmelik Z.	24
Coppola A.	81
Corapci B.	162
Cosciani-Cunico E.	261
Cosmai L.	176
Costanzo N.	148
Cui S.	282
D'Amico M.	329
D'Amico S.	261
Dalzini E.	261
Daminelli P.	261
De Faveri D.M.	252
De Noni I.	197
De Pilli T.	183
Del Signore A.	153
Derossi A.	183

Di Ciccio P. 116
Di Giacomo F. 153
Di Vita G. 329
Diakun J. 210
Dłużewska E. 142
Drees F. 427
Droli M. 451
Drosinos E.H. 12
Dugo G. 41
Dursun S. 370
Dziedzic K. 103
Ekin I. 56
Elcioglu O. 31
Engül M.S. 235
Engül M.S. 235
Ercisli S. 317
Erkan N. 370
Erkaya T. 235
Eryasar K. 162
Eshaghi Gorji M. 325
Fadavi Gh. 243
Festino A. 116
Filipiak-Florkiewicz A. 275
Finazzi G. 261
Fiori M. 134
Florkiewicz A. 275
Florowska A. 142
Fuselli F. 134
Gaeta D. 355
Gentile F. 41
Ghidini S. 116
Giannetto C. 335
Girgenti V. 74
Giuggioli N.R. 74
Giuliani R. 183
Gomes T. 176
Górecka D. 103
Greppi G.F. 91
Guarnieri A. 190
Gürakan G.C. 308
Habibi S. 325
Hamed Jafari Vayghan 169
Hęś M. 103
Hikmet Boyacioglu M. 268
Honarvar M. 349
Hosseini M.A. 325
Hussain S. 62
Ianieri A. 116
Iseppi L. 451
Jacyno E. 203
Jakubczak K. 142
Jurikova T. 317
Kaba N. 162
Klejdus B. 317
Koçak F. 18
Kostogrys R.B. 275
Kunduhoglu B. 31
La Torre G.L. 41
Lanfranchi M. 335
Latorre M.A. 420
Laureati M. 355
Leng Yun 300
Li M. 109
Liang Yingxi 282
Liu Z. 109
Longo L. 134
Losio M.N. 261
Maggi L. 252
Manfreda G. 412
Marcello S. 252
Marrone R. 390
Martelli R. 190
Masotti F. 197
Mierzejewska S. 433
Milinović B. 24
MLcek J. 317
Modzelewska-Kapitula M. 363
Mohamed A. 62
Mohammad Alizadeh 169
Mohammadifar M.A 243
Mura S. 91
Mustapha M.K. 221

Nalage A.B. 127
Omaraee Y. 243
Ozturk Yilmaz S. 317
Pagliarini E. 355
Palocci G. 134
Pappalardo G. 329
Paradiso V.M. 176
Paramihiotis S. 12
Parviz M. 325
Pasqualone A. 176
Peano C. 74
Pecorinoiu B. 329
Pepe T. 390
Petracci M. 412
Petrović M. 24
PiepioÅLrka-Stepuk J. 210
Piepiórka-Stepuk J. 433
Pietrzak-Fiećko R. 363
Potortì A.G. 41
Qiao Y. 282
Rafieian-Kopaei M. 427
Ramoscelli J. 252
Rastmanesh R. 243
Rezaei M. 325
Rimini S. 412
Rodríguez-Sánchez J.A. 420
Roggero P.P. 91
Rokni N. 427
Sadok S. 390
Şahin A. 398
Saitta M. 41
Salako A.F. 221
Salehi E. 427
Santoro A.M.L. 148
Sarno E. 148
Sengun I.Y. 383
Serrano R. 289
Sevda Saleh Ghadimi 169
Severini C. 183
Seyed Jamal
Ghaemmaghami Hezaveh 169
Sharafati-Chaleshtori A. 427
Sharafati-Chaleshtori R. 427
Shariatifar N. 325
Smaldone G. 390
Sochor J. 317
Soysal Ç. 18
Spigno G. 252
Stuknyte M. 197
Suárez-Belloch J. 420
Summo C. 176
Taheri N. 243
Topolska K. 275
Tripaldi C. 134
Tropea A. 41
Ulutaş Z. 389
Vahčić N. 24
Vannini L. 190
Varaee M. 349
Vergara A. 116
Verneau F. 81
Vlontartzik E. 12
Vujević P. 24
Wang J. 109
Wang L. 282
Wang X. 109
Wang Yu-Sheng 300
Wu H. 109
Yeşilayer N. 162
Yildiz H. 235
Yildiz P.O. 405
Yıldırım A. 398
Yuan J. 282
Yücel Ş. 162
Zaeri F. 243
Zanardi E. 116
Zanoni B. 3
Zarbà A.S. 443
Zargaraa A. 243
Zhang X. 282
Zhao Xia 300
Zhao Yang 300

CONTENTS OF VOLUME XXVI - 2014

OPINION PAPER

Which Processing Markers Are Recommended for Measuring and Monitoring the Transformation Pathways of Main Components of Olive Oil?
B. Zanoni 3

PAPERS

Enterocin Production by *Enterococcus Faecium* Strains Isolated From Greek Spontaneously Fermented Sausages
S. Paramihiotis, E. Vlontartzik and E.H. Drosinos 12

Development of New Tyrosinase Type Time Temperature Indicator
F. Koçak and Ç. Soysal 18

Lipids and Minerals of the Most Represented Hazelnut Varieties Cultivated in Croatia
P. Vujević, M. Petrović, N. Vahčić, B. Milinović and Z. Čmelik 24

Probiotic Characteristics of Natural Lactobacilli Isolated From Traditional Kargi Tulum Cheese
O. Elcioglu and B. Kunduhoglu 31

Phenolic Profile Selected Sicilian Wines Produced by Different Techniques of Breeding and Cropping Methods
G.L. La Torre, M. Alfa, F. Gentile, A.G. Potortì, M. Saitta, A. Tropea and G. Dugo 41

Distribution of Fatty Acids and Total Lipids in Five Tissues of Edible Snail *Helix Lucorum* (L., 1758) from the Southeast of Turkey
İ. Ekin 56

Berhi Dates Pits-Enriched Bread: Effect on Dough Rheology, Bread Quality, and Shelf Life
M.S. Alamri, A. Mohamed, S. Hussain and I.M. Al-Ruquie 62

The Use of a Modified Atmosphere for the Storage of Chestnut Fruits
C. Peano, C. Baudino, N.R. Giuggioli and V. Girgenti 74

Neophobian in Food Consumption: An Empirical Application of the FTNS Scale in Southern Italy
A. Coppola, F. Verneau and F. Caracciolo 81

Nanotechnology and its Applications in Food and Animal Science
S. Mura, D. Carta, P.P. Roggero, F. Cheli and G.F. Greppi 91

A Characteristic of Dietary Fiber in Barley and Buckwheat Groats and its Bile Acid Binding Capacity
D. Górecka, K. Dziedzic and M. Hęś 103

Changes in Polyphenolic Composition and Bioactivity of Bijia Tea During Storage
H. Wu, X. Wang, J. Wang, M. Li, L. An and Z. Liu 109

SHORT COMMUNICATION

Effects of Gaseous Ozone on Food-Borne Pathogens
P. Di Ciccio, S. Ghidini, E. Zanardi, S. Borrello, A. Vergara, A. Festino and A. Ianieri 116

PREVIEW ON VOLUME XXVI No. 2, 2014 119
GUIDE FOR AUTHORS 120
CONTRIBUTORS 123

PAPERS

Studies on Preparation of Mixed Toffee from Aonla and Ginger
A.B. Nalage, U.D. Chavan and R. Amarowicz **127**

Effect of Reduced Dry Salting on the Characteristics of PDO Pecorino Romano Cheese
C. Tripaldi, G. Palocci, M. Fiori, L. Longo, F. Fuselli, G. Catillo and M. Addis **134**

Effect of Gum Arabic and Gum Ghatti on the Stability of Beverage Emulsions
E. Dłużewska, K. Jakubczak and A. Florowska **142**

Effects of Ozonized Flake Ice on Sensory and Microbiological Quality of *Pagellus Erythrinus*
N. Costanzo, E. Sarno and A.M.L. Santoro **148**

Cheese Making Using Pig Rennet and Calf Rennet: microorganisms and volatile compounds in Farindola ewe cheese
F. Di Giacomo, N. Casolani and A. Del Signore **153**

Determination of Shelf Life of Fish Ball Marinated After Frying Process
N. Kaba, B. Corapci, K. Eryasar, Ş. Yücel and N. Yeşilayer **162**

Assessment of Dietary Exposure to 5-hydroxymethylfurfural from Traditional Iranian Flat Breads
Sevda Saleh Ghadimi, Mohammad Alizadeh, Ali Tarighat Esfanjani, Seyed Jamal Ghaemmaghami Hezaveh and Hamed Jafari Vayghan **169**

Oxidation Compounds in Extra Virgin Olive Oils, Fresh or Stored, After Frying
C. Summo, F. Caponio, V.M. Paradiso, M.T. Bilancia, A. Pasqualone, L. Cosmai and T. Gomes **176**

Development of Maillard Reaction in Pasta Dried by Microwaves
T. De Pilli, R. Giuliani, A. Derossi and C. Severini **183**

Harvesting and Field Packaging of Tree-Ripened Peach Fruits, Critical Evaluation
A. Guarnieri, R. Martelli, A. Berardinelli and L. Vannini **190**

Variations in the Volatile Fraction of Bitto Cheese Produced During Herd Transhumance
M. Stuknyte, S. Cattaneo, F. Masotti and I. De Noni **197**

Chemical Composition and Nutritive Value of Protein in Hulled Dwarf Oat Lines and the Effect on Serum Lipid Profile in Rats
W. Biel and E. Jacyno **203**

Numerical Analysis of Fluid Flow Velocity Between Plates Channel of Heat Exchanger by Different Surface Configuration in Reference to the Effects of Cleaning
J. Piepiórka-Stepuk and J. Diakun **210**

SHORT COMMUNICATION

Proximate Analysis of Fish Dried with Solar Driers
M.K. Mustapha, T. B. Ajibola, S.K. Ademola and A. F. Salako **221**

PREVIEW ON VOLUME XXVI No. 3, 2014 ..... **227**
GUIDE FOR AUTHORS **228**
CONTRIBUTORS **231**

PAPERS

An Investigation of the Antioxidant Activities and Some Physicochemical Characteristics of Strawberry Added Yogurt
M.S. Engül, T. Erkaya, M.S. Engül and H. Yildiz **235**

Rheological and Clustering Approach to Classify Iranian Soft/Liquid Food Products to Meet Dysphagia Diet Requirements
A. Zargaraa, Y. Omaraee, R. Rastmanesh, N. Taheri, Gh. Fadavi, F. Zaeri and M.A Mohammadifar **243**

Bioactive Compounds in Industrial Tomato Sauce After Processing and Storage
G. Spigno, L. Maggi, D. Amendola, J. Ramoscelli, S. Marcello and D.M. De Faveri **252**

Prediction of the Maximal Growth Rate of *Listeria monocytogenes* in Sliced Mortadella by the Square Root Type Model
P. Daminelli, E. Dalzini, E. Cosciani-Cunico, G. Finazzi, S. D'Amico and M.N. Losio **261**

Effect of Temperature Shear Rate and Processing on the Rheological Properties of Salep Drink
D. Arduzlar Kagan, M. Hikmet Boyacioglu and D. Boyacioglu **268**

The Effect of Technological Processing on the Chemical Composition of Cauliflower
A. Florkiewicz, A. Filipiak-Florkiewicz, K. Topolska, E. Cieslik and R.B. Kostogrys **275**

Angiotensin I Converting Enzyme Inhibitory and Antioxidant Activity of Adlay (*Coix lacrymajobi* L. var. *ma-yuen Stapf*) Glutelin Hydrolysate
J. Yuan, Yingxi Liang, S. Cui, X. Zhang, L. Wang and Y. Qiao **282**

Factors Limiting the Shelf-Life of Salami Pieces Kept in Retailing Conditions
S. Bañón, R. Serrano and M. Bedia **289**

The Effect of Polysaccharide Concentration and pH on Physicochemical Properties of Flaxseed Polysaccharide-Potato Starch Mixtures
Hai-Hua Chen, Yu-Sheng Wang, Yun Leng, Yang Zhao and Xia Zhao **300**

Phenotypic Diversity and Technological Properties of Yogurt Cultures Isolated from Traditionally Produced Turkish Yogurts with Comparison to Commercial Starter Cultures
N. Altay Dede, E. Acar-Soykut and G. C. Gürakan **308**

Polyphenolic Profile of Interspecific Crosses of Rowan (*Sorbus aucuparia* L.)
T. Jurikova, J. Sochor, J. MLcek, S. Balla, B. Klejdus, M. Baron, S. Ercisli and S. Ozturk Yilmaz **317**

SHORT COMMUNICATION

Occurrence of Aflatoxin M1 in Milk in Qom, Iran
M. Rezaei, M. Parviz, M. Eshaghi Gorji, N. shariatifar, M.A. Hosseini and S. Habibi **325**

SURVEYS

Short Supply Chain and Locally Produced Wines: Factors Affecting Consumer Behaviour
M. D'Amico, G. Di Vita, G. Chinnici, G. Pappalardo and B. Pecorinoiu **329**

Analysis of Producers' Knowledge about Farmers' Markets
M. Lanfranchi and C. Giannetto **335**

PREVIEW ON VOLUME XXVI No. 4, 2014 ..... **341**
GUIDE FOR AUTHORS **342**
CONTRIBUTORS **345**

PAPERS

Bio-Reduction of Organic Pollutants in Sugar Cane Filter Cake
by *Aneurinibacillus Migulanus*
M. Varaee, M. Honarvar, A. Akhavan Sepahi 349

Qualitative and Sensory Evaluation of Sangiovese Red Wine Obtained
from Organically and Conventionally Grown Grapes
M. Laureati, D. Gaeta and E. Pagliarini 355

Fatty Acid Profile of Polish Meat Products
R. Pietrzak-Fiećko and M. Modzelewska-Kapitula 363

The Effect of Edible Coating on the Quality of Smoked Fish
S. Dursun and N. Erkan 370

Influence of Ozonated Water on Microbial Load and Shelf Life of Shredded Carrots
I.Y. Sengun 383

Swordfish Steaks Vacuum-Packed with *Rosmarinus Officinalis*
A. Anastasio, R. Marrone, C. Chirollo, G. Smaldone, M. Attouchi, P. Adamo, S. Sadok and T. Pepe 390

Some Physicochemical Characteristics of Raw Milk of Anatolian Buffaloes
A. Şahin, A. Yıldırım and Z. Ulutaş 389

Effect of Thyme Oil and Packaging on the Quality of Smoked Trout Stored at 4°C
P.O. Yildiz 405

Quality Characteristics of Ground Pork Meat Obtained Using Mechanical Desinewing
M. Petracci, S. Rimini, G. Manfreda and C. Cavani 412

Effect of Pig Slaughter Weight on Chemical and Sensory Characteristics
of Teruel Dry-Cured Ham
J.A. Rodríguez-Sánchez, S. Calvo, J. Suárez-Belloch and M.A. Latorre 420

Use of Tarragon (Artemisia Dracunculus) Essential Oil as a Natural Preservative
in Beef Burger
R. Sharafati-Chaleshtori, N. Rokni, M. Rafieian-Kopaei, F. Drees, A. Sharafati-Chaleshtori and E. Salehi 427

Numerical Analysis of Fluid Flow Velocity in Selected Elements of Pipeline Installations
with References to the Effects of Cleaning
J. Piepiórka-Stepuk and S. Mierzejewska 433

SURVEYS

The Logistics of Direct Slaes: New Approaches of the EU
V. Allegra, C. Bellia and A.S. Zarbà 443

Does Smart Agriculture Go Downstream in the Supply Chain?
T.F.M. Chang, M. Droli and L. Iseppi 451

PREVIEW ON VOLUME XXVII No. 1, 2015 458
AUTHOR INDEX 459
CONTENTS OF VOLUME XXVI 462
GUIDE FOR AUTHORS 466
CONTRIBUTORS 469

GUIDE FOR AUTHORS
ITALIAN JOURNAL OF FOOD SCIENCE -IJFS

Publication Ethics and Publication Malpractice

Italian Journal of Food Science is committed to upholding the highest standards of publication ethics and takes all possible measures against any publication malpractices. All Authors submitting their works to Italian Journal of Food Science for publication as original articles attest that the submitted works represent their Authors' contributions and have not been copied or plagiarized in whole or in part from other works. The Authors acknowledge that they have disclosed all and any actual or potential conflicts of interest with their work or partial benefits associated with it. In the same manner, Italian Journal of Food Science is committed to objective and fair Editor(s) review of the submitted for publication works and to prevent any actual or potential conflict of interests between the editorial personnel and the reviewed material. Any departures from the above-defined rules should be reported directly to the Editor-in-Chief, who is unequivocally committed to providing swift resolutions to any of such a type of problems.

1. Manuscript Submission

Manuscripts must submitted as an electronic version by e-mail to paolofan@unipg.it. The word processor used to generate the file should be indicated and the files should be saved in format "Text only"; **graphs, pictures and diagrams must be saved at 300 dpi in TIF, JPG or EPS formats** (not included in MsWord documents).

Manuscripts must be typed, double-spaced and pages should be in A4 format using Times New Roman 12 pt as the advised font. Top, bottom and side margins should be 25 mm. Pages and lines on all pages, including those for References and figure legends, **must be electronically numbered in the left margin.**

English is the official language. The Editor-in-Chief and/or Co-Editors reserve the right to make literary corrections and to make suggestions to improve brevity, but **the paper must be previously revised for English by the authors**. If English is not the mother tongue of authors, they **must seek** help from one of the following agencies (or other similar official agencies):

www.journalexperts.com
www.sciencedocs.com
www.internationalscienceediting.com
www.writescienceright.com
www.genedits.com

2. Manuscript Preparation

(1) The paper should be divided under the following headings in this order:

Title. Informative of the content of the article (<50 characters + spaces).

Author(s). Initials and Surname, omit professional and official titles. The institute and address where the research was carried out and the current address of each author should be given on the title page.

Abstract. Clearly state the objective of the study, give a concise description of experiment(s), observations, results and conclusions. No references should be cited. **Do not exceed 100 words**.

Key words. Up to six words, in alphabetical order, which describe the document must be given to aid data retrieval and indexing.

Introduction. Review pertinent previous work and cite appropriate references. State the purpose of the investigation.

Materials and Methods. Indicate apparatus, instruments, reagents, etc., giving sufficient detail to allow the work to be repeated.

Results and Conclusions. Results and Conclusions may be presented together or separately. Concisely present results using tables and figures to help justify conclusions (do not present the same information in both forms). Use statistical analysis when appropriate. Unsupported hypotheses should be avoided. Conclusions should point out the significance of the findings and, if possible, relate the new findings to some problem in Food Science and Technology.

Acknowledgments. Acknowledgments of assistance are appropriate provided they are not related to analyses or other services performed for a fee. Financial support, thanks for assistance, artic1e number or thesis fulfilment may be included.

Units. A list of units particular to the paper may be included.

References. References in the Reference list should be arranged alphabetically (initials of first name, only), and, for the same author, should be arranged consecutively by year, typed double-spaced. Each individual reference should begin flush left (no indentation). Refer to attached examples taken from "Style Guide for Research Papers" by the Institute of Food Technologists (Chicago - I1linois - USA). Literature citations in the text should be referred to by Surname and year in parentheses. If there are more than two authors, give the surname of the first author and add et al. and the year in parentheses. Examples: (SMITH, 2007), (SMITH and JONES, 2008) (SMITH et al., 2008).

(2) Tables should be as few and as simple as possible and include only essential data. Each table must be saved and printed on a separate sheet and have an Arabic number, e.g. Table 4 NOT Tab.

4. Legends must be self-explanatory and on a separate sheet. Use lower-case letters for footnotes in tables and explain below the table in the order in which they appear in the table.

(3) Figures must be prepared and saved separately in **TIF, JPEG, EPS (300 dpi resolution).** They should be prepared so that on 50% reduction, lines, figures and symbols will be clearly legible and not overcrowded. All figures must be given Arabic numbers, e.g. Fig. 3. Legends for figures must be self-explanatory and should be typed on a separate sheet under "Legends to Figures".

(4) Standard Usage, Abbreviations and Units. The Concise Oxford and Webster's English Dictionaries are the references for spelling and hyphenation. Statistics and measurements should always be given in figures, e.g. 10 min, except when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelled out unless it is 100 or greater. Abbreviations should be used sparingly, only when long or unwieldy names occur frequently, and never in the title; they should be given at the first mention of the name. International Standard abbreviations should generally be used except where they conflict with current practice or are confusing. For example, 3 mm rather than $3x10^{-3}$ m. Abbreviations should be defined the first time they are used in the text and they should be used consistently thereafter. Temperatures should be expressed in the Celsius (centigrade) scale. Chemical formulae and solutions must specify the form used, e.g. anhydrous or hydrated, and the concentration must be in c1early defined units.

Common species names should be followed by the Latin binomial (italics) at the first mention. For subsequent use, the generic name should be contracted to a single letter if it is unambiguous.

3. Editorial and Review Policy

Scientific contributions in one of the following forms may be submitted:

Reviews –They can be submitted directly to the Editor-in-Chief or articles can be requested directly by the Editor-in-Chief.

Short Communications, Surveys and Opinions – They do not need to have the formal organization of a research paper; they will receive priority in publication; maximum of five pages allowed.

Papers – The paper must follow the guidelines as specified under the section Manuscript Preparation.

Reviews, Papers, Short Communications and Surveys will be **subjected to critical review by referees.**

(1) Manuscripts will be processed in the order received. The Editor-in-Chief will select papers to enter into the reviewing system based on originality and innovation. A letter will be sent to the authors acknowledging receipt of the manuscript along with a Declaration form stating that it has NOT been previously published, accepted or submitted for publication elsewhere and agreeing to the page charges upon acceptance of the paper. On receipt of the signed Declaration form, the Editor-in-Chief will send the manuscript to a Co-Editor and/or referees for evaluation.

(2) Authors may suggest to IJFS possible referees. The Editor-in-Chief and Co-Editors reserve the right of their utilization.

(3) Referees may not be from the same institution as the author. Referees should make their comments and questions in detail and return the paper to the Editor-in-Chief and/or Co-Editor as soon as possible, usually within two weeks. The identity and report of the referees are made know to the Editor-in-Chief, but only the anonymous referee report is sent to the author(s). If all referees recommend acceptance or rejection, the decision stands. If the opinions of the referees tie, the Editor-in-Chief and/or Co-Editors have the freedom to decide upon acceptance or rejection of the paper.

(4) The results of the refereeing process, accompanied by a letter from the Editor-in-Chief or the Co-Editor, will be sent to the author(s). Papers needing revision must be returned to the Co-Editor within the timeframe suggested, otherwise the paper will be considered as withdrawn. A letter announcing acceptance of the manuscript will be sent to the author(s) upon acceptance by the referees.

(5) The authors **will receive galley proofs** of the manuscript along **with the invoice** for the page charges (stated on the first page of each issue) which **must be paid in order to allow for publication**. The proofs will be sent to the corresponding author as a PDF file by e-mail, only. A hard copy will be sent by mail only if the author makes this request when the paper is accepted for publication.

The revised galley proofs must be returned by fax or mail to Chiriotti Editori – 10064 Pinerolo (TO) – Italy –Fax: +39 0121 794480; e-mail: info@chiriottieditori.it

Italian Journal of Food Science would like to thank all the Referees who have contributed to keep up the value of the journal with their important work.

For this reason, all the Referees can download free of charge all the issues of the Italian Journal of Food Science from our website.

REFERENCE EXAMPLES

EXAMPLES of use in a Reference list are given below. The bold-faced parenthetical type of citation above the example is indicated ONLY for information and is NOT to be included in the reference list.

(Anonymous)

Anonymous. 1982. Tomato product invention merits CTRI Award. Food Technol. 36(9): 23.

(Book)

AOAC. 1980. "Official Methods of Analysis" 13th ed. Association of Official Analytical Chemists, Washington, DC.

Weast, R.C. (Ed.). 1981 "Handbook of Chemistry and Physics" 62nd ed. The Chemical Rubber Co. Cleveland, OH.

(Bulletin, circular)

Willets C.O. and Hill, C.H. 1976. Maple syrup producers manual Agric. Handbook No. 134, U.S. Dept. of Agriculture, Washington, DC.

(Chapter of book)

Hood L.F. 1982. Current concepts of starch structure. Ch. 13. In "Food Carbohydrates". D.R. Lineback and G.E. Inglett (Ed.), p. 217. AVI Publishing Co., Westport, CT.

(Journal)

Cardello A.V. and Maller O. 1982. Acceptability of water, selected beverages and foods as a function of serving temperature. J. Food Sci. 47: 1549.

IFT Sensory Evaluation Div. 1981a. Sensory evaluation guide for testing food and beverage products. Food Technol. 35 (11): 50.

IFT Sensory Evaluation Div. 1981b. Guidelines for the prepaation and review of papers reporting sensory evaluation data. Food Technol. 35(4): 16.

(Non-English reference)

Minguez-Mosquera M.I., Franquelo Camacho A, and Fernandez Diez M.J. 1981. Pastas de pimiento. Normalizacion de la medida del color. Grasas y Aceites 33 (1): 1.

(Paper accepted)

Bhowmik S.R. and Hayakawa, K. 1983. Influence of selected thermal processing conditions on steam consumption and on mass average sterilizing values. J. Food Sci. In press.

(Paper presented)

Takeguchi C.A. 1982. Regulatory aspects of food irradiation. Paper No. 8, presented at 42nd Annual Meeting of Inst. of Food Technologists, Las Vegas, NV, June 22-25.

(Patent)

Nezbed R.I. 1974. Amorphous beta lactose for tableting U.S. patent 3,802,911, April 9.

(Secondary source)

Sakata R., Ohso M. and Nagata Y. 1981. Effect of porcine muscle conditions on the color of cooked cured meat. Agric. & Biol. Chem. 45 (9): 2077. (In Food Sci. Technol. Abstr. (1982) 14 (5): 5S877).

Wehrmann K.H. 1961. Apple flavor. Ph. D. thesis. Michigan State Univ., East Lansing. Quoted in Wehrmann, K.H. (1966). "Newer Knowledge of Apple Constitution", p. 141, Academic Press, New York.

(Thesis)

Gejl-Hansen F. 1977. Microstructure and stability of Freeze dried solute containing oil-in-water emulsions Sc. D. Thesis, Massachusetts Inst. of Technology, Cambridge.

(Unpublished data/letter)

Peleg M. 1982. Unpublished data. Dept. of Food Engineering., Univ. of Massachusetts, Amherst.

Bills D.D. 1982. Private communication. USDA-ARS. Eastern Regional Research Center, Philadelphia, PA.

CONTRIBUTORS

Gratitude is expressed to the following entities for contributing to the realization of the Journal by being supporting subscribers for 2014.

ASSOCIATIONS and COMPANIES

Associazione Italiana di Tecnologia Alimentare (A.I.T.A.) - Parma — Fax +39-0521-230507 www.aita-nazionale.it

Società Italiana di Scienze e Tecnologie Alimentari (S.I.S.T.Al) - Perugia — Fax +39-075-5857939 www.sistal.org

RESEARCH INSTITUTES

Dipartimento di Valorizzazione e Protezione delle Risorse Agroforestali (DI.VA.P.R.A.), Sezione Microbiologia ed Industrie Agrarie, Università di Torino, Grugliasco — Fax +39-011-6708549

Biblioteca di Agraria, Università degli Studi di Milano, Milano — Fax +39-02-50316427

ITALIAN JOURNAL OF FOOD SCIENCE
Rivista Italiana di Scienza degli Alimenti
DIRETTORE RESPONSABILE: Alberto Chiriotti
AUTORIZZAZIONE: n. 3/89 in data 31/1/1989
del Tribunale di Perugia
TIPOGRAFIA Giuseppini - Pinerolo

ISSN 1120-1770 © 2014

CHIRIOTTI EDITORI srl - 10064 Pinerolo - Italy

publishes the technical magazines:

VOLUME XXVI IJFS No. 4, 2014

CONTENTS

PAPERS

Bio-Reduction of Organic Pollutants in Sugar Cane Filter Cake by *Aneurinibacillus Migulanus*
M. Varaee, M. Honarvar, A. Akhavan Sepahi ***349***

Qualitative and Sensory Evaluation of Sangiovese Red Wine Obtained from Organically and Conventionally Grown Grapes
M. Laureati, D. Gaeta and E. Pagliarini ***355***

Fatty Acid Profile of Polish Meat Products
R. Pietrzak-Fiećko and M. Modzelewska-Kapitula ***363***

The Effect of Edible Coating on the Quality of Smoked Fish
S. Dursun and N. Erkan ***370***

Influence of Ozonated Water on Microbial Load and Shelf Life of Shredded Carrots
I.Y. Sengun ***383***

Swordfish Steaks Vacuum-Packed with *Rosmarinus Officinalis*
A. Anastasio, R. Marrone, C. Chirollo, G. Smaldone, M. Attouchi, P. Adamo, S. Sadok and T. Pepe ***390***

Some Physicochemical Characteristics of Raw Milk of Anatolian Buffaloes
A. Şahin, A. Yıldırım and Z. Ulutaş ***389***

Effect of Thyme Oil and Packaging on the Quality of Smoked Trout Stored at 4°C
P.O. Yildiz ***405***

Quality Characteristics of Ground Pork Meat Obtained Using Mechanical Desinewing
M. Petracci, S. Rimini, G. Manfreda and C. Cavani ***412***

Effect of Pig Slaughter Weight on Chemical and Sensory Characteristics of Teruel Dry-Cured Ham
J.A. Rodríguez-Sánchez, S. Calvo, J. Suárez-Belloch and M.A. Latorre ***420***

Use of Tarragon (Artemisia Dracunculus) Essential Oil as a Natural Preservative in Beef Burger
R. Sharafati-Chaleshtori, N. Rokni, M. Rafieian-Kopaei, F. Drees, A. Sharafati-Chaleshtori and E. Salehi ***427***

Numerical Analysis of Fluid Flow Velocity in Selected Elements of Pipeline Installations with References to the Effects of Cleaning
J. Piepiórka-Stepuk and S. Mierzejewska ***433***

SURVEYS

The Logistics of Direct Slaes: New Approaches of the EU
V. Allegra, C. Bellia and A.S. Zarbà ***443***

Does Smart Agriculture Go Downstream in the Supply Chain?
T.F.M. Chang, M. Droli and L. Iseppi ***451***

PREVIEW ON VOLUME XXVII No. 1, 2015 ..... ***458***
AUTHOR INDEX ***459***
CONTENTS OF VOLUME XXVI ***462***
GUIDE FOR AUTHORS ***466***
CONTRIBUTORS ***469***