

The Impact of Health Claims on Food Production and Eating Habits: An Analysis of the Evolution of Consumption in Italy

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Abstract

In Developed Countries, the problem of malnutrition is mainly connected to excessive food-intake whose direct consequences can be overweight and obesity. In the last decades, these problems increased significantly and they are expected to rise in the next future.

Consumers education towards healthier food models is the main tool to prevent overweight and obesity.

The European Union has approached the issue through regulatory actions that, from 2006, have completed the existing general framework of labelling requirements, by providing for specific provisions aimed at protecting the consumer's right to correct information on nutritional and health properties of food.

In this framework, the aim of this paper is to verify if after ten years of the introduction of the European Regulation 1924/2006, the declared objectives have been reached.

In particular, an analysis in depth, regarding the evolution of lifestyle, health conditions and food production in Italy in the period 2005-2014 has been carried out.

Keyword: health claim, obesity, consumer education, food label, malnutrition, eating habit.

1. Introduction

The term malnutrition shall mean “an abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes under-nutrition and over-nutrition as well as micro-nutrient deficiencies” (FAO, 2015).

It follows that, malnutrition is a very complex phenomenon affecting with varying intensity Countries all over the world, due to the different forms it could take.

In developed Countries, the phenomenon of malnutrition is reflected in overweight and obesity into adulthood and childhood (Croppenstedt, *et al.*, 2013). These are so widespread and increasing problems, that, in developed Countries, the population eating more calories than needed increased from 38.8% in 1990 to 41.0% in 2000 to 45.7% in 2015 (FAO, 2016).

From 1980 to 2015, in 20 out of 34 OECD Countries, the number of obese is doubled and it is estimated that, at least, one person in two will be obese by 2020 (WHO, 2016).

The growing incidence of overweight and obesity problem depends on a wide variety of factors, primarily the evolution of socio-economic conditions and their effects on patterns of food consumption and lifestyle.

However, it should be noted that to a higher level of disposable income has not followed an equivalent raising the level of food education. This situation was partly due to the trends of price for foodstuffs that, in the long term, following the innovations in agricultural and food product technology, increased less than disposable income, causing higher quantity of food being consumed per capita and leading to favour patterns of food consumption based on excessive intake of food (Zheng and Zhen, 2008).

Another important consideration is that, as consequence of the improvement of socio-economic conditions, manual work activities have been reduced considerably while sedentary ones have increased.

Such changes, together with the growing food availability and consumption, have contributed to lay down preconditions for overeating that lies at the root of overweight and obesity problems.

In this respect it is considered that, according to a recent survey carried out in EU (Eurobarometer, 2014) about 59% of the populations do never or rarely physical activity and about two-thirds (69%) of respondents spend between 2.5 and 8.5 hours sitting (+5 pp), while at other extremes, 11% sit for more than 8.5 hours and 17% 2.5 hours or less.

This already complex set-up looks set to be even more in the future according to recent evidence showing that physical activity declines from the age of school entry (Tremblay, *et al.*, 2014).

Overweight and obesity should be regarded as expression of a poor state of health and they represent a major risk factor in a variety of serious diseases, first of all diabetes, heart diseases and some cancers (WHO, 2015).

Taking into consideration that overweight and obesity are the fifth risk factor for mortality worldwide and the number of deaths attributable to obesity are estimated in more than 2.8 million annually, it follows that these phenomena have a decisive impact both on life expectancy (LE) and healthy life years (HLY).

In particular, recent surveys showed that despite average life expectancy is growing, there is a big gap between life expectancy (LE) and healthy life years (HLY) in developed Countries. This is due to the spread of overweight and obesity (Groven, *et al.*, 2015).

The World Health Organization and the National Health Authorities of developed Countries would long agree that overweight and obesity are both consequences of eating patterns with an excessive consumption of animal protein, saturated fat, rapid absorption sugar and processed food and sedentary lifestyle.

Such a situation creates both sanitary implications and socio-economic problems.

In this regard, it should be noted that about 40% of costs arising from malnutrition are globally generated by overweight and obesity diseases that in turn weight for 2% of global Gross Domestic Product (GDP). In absence of promptly concrete action, these costs are likely to increase rapidly.

Social costs should be added to sanitary costs. Social costs derive from inevitable conflicts between the profit margins of

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food producer, which market high added-value products, and consumer's rights to access to not detrimental to health food and information.

It follows that, precisely because of the close link between consumption patterns and the emergency of overweight and obesity, nutritional information on food are of particular economic significance. This raises the issue of important information asymmetries between producers and consumers (Kolodinsky, 2012).

The European Union is for a long time aware of the need to work to reduce the costs resolving the above mentioned conflicts of interest.

Preventive measures aimed at providing for correct information on nutritional characteristics of food have been laid down to manage the evident relationships between consumption patterns and overweight and obesity.

Taking into consideration the particularity of European internal market that, as it is well known, brings national markets of the individual Member States together in a single market, the issue has been addressed through the definition of a single Regulatory instrument to regulate and to harmonize the nutritional information on labels and to ensure a high level of protection for consumers and to facilitate their choice.

To this regard, The EU has issued the Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods.

The main innovation of this Regulation is the new scope of labelling provisions that, in accordance of Directive 2000/13/EC, generally prohibits the use of information that would mislead the purchaser or attribute medicinal properties to food.

In light of this, Regulation 1924/2006 complement the general principles in Directive 2000/13/EC and lay down specific provisions concerning the use of nutrition and health claims concerning foods to be delivered as such to the consumer.

In particular, Regulation 1924/2006, to whereas 4, states that "it should apply to all nutrition and health claims made in commercial communications, including, inter alia, generic advertising of food and promotional campaigns, such as those supported in whole or in part by public authorities. It should not apply to claims which are made in non-commercial communications, such as dietary guidelines or advice issued by public health authorities and bodies, or non commercial communication and information in the press and in scientific publications. This Regulation should also apply to trade-marks and other brand names which may be construed as nutrition or health claims. Non-beneficial nutrition claims are not covered by the scope of Regulation 1924/2006".

In view of this, after ten years of the introduction of the new Regulation, it is of particular interest to verify if the rules set out therein have contributed to orient consumers towards more correct eating patterns and have reduced the above mentioned conflicts of interest.

2. The communication and promotion of healthy eating habits: the role of food industry and consumer perception

The existence of a close link between nutrition and health has long been recognised and it is laid down in the Universal Declaration of Human Rights of 1948, how it is shown in the article 25 comma 1: "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care..." (UN, 2015 Universal declaration of Human Rights, New York).

It is evident that, in developed Countries, the issue of protection of rights to health and to nutrition does not arise in relation to a decent standard of living to ensure them, but in the definition and maintenance of a context (health services, education, information,...) enabling citizens to assess their rights.

There has long been the full awareness that malnutrition is a very complex and widespread issue. In order to deal with it, it is necessary to take into consideration the different socio-economic

characteristics of the individual Countries, adopting appropriate measures.

To ensure that, the 1st April 2016, the United Nations General Assembly adopted a resolution proclaiming the period 2016-2025 the decade of action on malnutrition. During this period, actions aimed at both eradicating hunger and promoting healthy eating habits should be promoted (United Nations General Assembly, 2015).

In the new operative context that starting to emerge following on from the abovementioned UN initiative, many recent studies assume great importance. According to these studies, lifestyle and eating habits can prevent the development of serious conditions and the control of their development or, on the contrary they can be the cause of serious illness (Schröder, 2006) (La Vecchia, 2006) (Couto, *et al.*, 2008) (Ferris-Tortajada, *et al.*, 2012) (Scoditti, *et al.*, 2012).

The Mediterranean diet is one of the most widely studied eating patterns, and the benefits of its adopting are widely recognized (Sofi, *et al.*, 2008) (Romaguera, *et al.*, 2010).

The attention paid on alternative to the current ones eating patterns, such as the Mediterranean diet, is an expression of the awareness to search and propose new dietary habits, first of all through training and education (Voinea, 2012).

The need to promote dietary habits aimed at limiting overweight and obesity, thanks to the UN initiative too, will continue to be important in the future.

It follows that, information given to consumers will continue to play an important role and, as such, will probably be source of potential conflicts of interest between food producers and consumers.

It is clear that in the framework both of implemented activities and measures which will be undertaken under the UN operational programme, the communication and promotion of healthy and sustainable eating habits would lead to common rules to be laid down to which provide information on the nature and characteristics of foodstuff.

It follows that, one of the greatest risks may occur is that consumers can rely on nutritional and healthy claims used by the food industry as means of communication, instead of following a nutrition programme and adopting a well balanced diet based on the right combination of fresh, healthy and unprocessed food.

This is a pressing matter because we need to consider that consumers are worried about the relationship between food and health but do not realize the considerable importance of their daily purchasing habits in terms of contributing to the problem, and therefore do not change them. It goes without saying that consumers continue to devolve decisions on both the causes and actions to be taken to agents belonging to specific sectors, mainly industrial ones, and not to their consumption choices.

The food industry has taken on board the concerns expressed by nutrition and medical science regarding the food-health relationship and now markets products with a high service content, satisfying the requirements imposed by new food models and meeting the needs of consumers, who are reluctant to change their dietary habits in line with new guidance and prefer to turn to the healthy versions of industrial foods. Purchasing choices, therefore reflect the new tendency to satisfy first and foremost needs of health and well-being, needs which have been induced through seductive marketing strategies.

Food risk is thus no longer perceived as tightly correlated to the intrinsic nature of products, but is extended to a wider level on which food risk derives from an incorrect and unbalanced combination of food. Consequently, rather than varying their diet and moving away from unbalanced diets with high levels of fat, meat and sugars, consumers carefully read the signals sent out by the food industry, which as above mentioned takes on the inappropriate role of dietary education.

The policy of food education is highlighted as a means of prevention but is exploited by the industry, which continually sends messages emphasizing the relationship between diet and health, inducing consumers to concentrate on this aspect and to find effective consolation for their choice of *convenience foods*,

for which they are even prepared to pay extra due to the quality of use that these foods incorporate (Calabrò, 2014).

As it is clear from the above, nutritional and health claims play an important role with a high risk to delegate to food industry the task of orienting consumers towards healthy choice. This shows an evident conflict of interests with consumer.

Such a situation may be considered to be detrimental to the main purpose of Regulation 1924/2006, because both the principles of free competition, and then the proper functioning of the internal market, and the protection of consumer's rights can be altered.

Ten years after the introduction of Regulation 1924/2006, many of the abovementioned negative effect have unfortunately occurred. This means that, especially with a view to new action to be implemented according to UN plan, we need to carefully reflect on information and education tools.

As abovementioned, nutritional and health claims must comply with the requirements of regulation 1924/2006. According to this, any commercial use of claims is subject to the authorization granted by European Food safety Agency (EFSA) whose task is to verify the correspondence between the information content of claims and the scientific evidences supporting them, normally submitted by food industry (Todt and Luján, 2015).

Notwithstanding other considerations about the way the EFSA evaluates presented dossiers, the authorization process made claims guaranteed for all intents and purposes by public authority.

Therefore, all the conditions are in place so that consumers are lead into recognizing credibility and authority to claims.

It follows that, two of the main features would affect consumer's choices should be combined through claims: the authority of the source of information and the easily and immediate understanding (Drescher, *et al.*, 2014).

It must be noted that, in most cases, an easily and immediate understanding is not directly related to the understanding of information content of claims but rather to the very existence of claims which are per se perceived as indicative of the healthiness of the related product.

That is clearly reflected in several studies showing that claims information content, quite apart from not being fully perceived (van Trijp and van der Lans, 2007), do not play a determining role in consumer's choices (Lähteenmäki, 2013). In fact, it was noted that consumer uses traditional parameters such as taste (Verbeke, 2006) (Sabbe, *et al.*, 2009), type of products, price and brand loyalty (Lalor, *et al.*, 2011) for making its own choices. It follows that, consumers make their choices using information provided by commercial channels and in this sense they rely more on advertising than on a deep analysis of the information regarding the characteristics of products (Verbeke, *et al.*, 2009) (Oakes, 2006).

For example, we must consider the consumers have a positive attitude towards functional food only if they perceive a global positive image of the product itself (Žeželj *et al.*, 2012) (Wills, *et al.*, 2012). At the same time, foodstuffs with a negative healthy image are not ennobled by the presence of a claim that by itself is not enough to improve the overall image (Lähteenmäki, *et al.*, 2010).

From the above, it follows that consumer's choices depends more from a set of characteristics- first of all the brand reputation – than from the information content of a claim.

As consequence, several factors varying on the basis of many aspects determine how a claim is perceived by consumers. For example, eating habits and familiarity with products shall be considered relevant on the basis of geographical areas (Saba, *et al.*, 2010); while the same concept claimed by different sources of information make it more convincing (Hall and Osses, 2013).

This is the case of omega 3 which thanks to incisive marketing campaigns aimed at enhancing its beneficial effect in preventing cardiovascular diseases, has become an indispensable ingredient added to many products in order to increase their healthiness (Bech-Larsen and Grunert, 2013) (Verbeke *et al.* 2009).

Other important variables through which claims influence consumer's choices are gender, educational level and clarity of the information contents of the same claims (Wills, *et al.*, 2012).

Consumer's behaviour varies on the basis of the different factors they use to perceive nutritional and health claims.

In this sense, consumer's behaviour of some products which are perceived as healthy, thanks to the presence of the claim, seems to be particularly interesting.

Some evidences suggest that describing food as healthy might have unintended side-effect on food intake. In some cases, the presence of a healthy claims translates in a sort of licence to overeat by reducing the guilt associated with eating; consumers are led to consume bigger quantity of products claimed as healthy respect to the traditional ones (Faulkner, *et al.*, 2014) (Smeets and van der Laan 2011) (Gravel, *et al.*, 2012) (Carels, *et al.*, 2006).

The results of a study (Provencher, *et al.*, 2009) is significant in this regard. The survey conducted among 99 female undergraduate students invited to taste some biscuits, showed that they ate about 35% more when the snack was regarded as healthy than when it was seen as unhealthy.

Similar situations have been shown regarding some products, generally considered as unhealthy, whose consumption increased when a healthy claim appeared, even if it regarded only one ingredient and not the products as a whole.

Also in the light of the surveys conducted, the framework that emerges regarding the utility of health claims as food education tool, in order to prevent overweight and obesity and the related diseases, seems not to be positive.

European Union has the same view; in fact, in 2012, it financed a four-year project called CLYMBOL (role of health related Claims and SYMBOLs in consumer behaviour) whose aim is "to understand better the effects of health claims and symbols on food labels and how this affects purchase and consumption behaviour" (Hieke, *et al.* 2015).

One of the main criticality to be solved in this regard is that, according to the existing Community rules, health information must be understandable by the "average consumer", a theoretical figure that is hard to match in the reality (Kyureghian, 2009).

Directive 2005/29/EC of the European Parliament and of the Council of 11 may 2005, concerning unfair business-to-consumer commercial practices in the internal market, in whereas 18, said that: "...this Directive takes as a benchmark the average consumer, who is reasonably well-informed and reasonably observant and circumspect, taking into account social, cultural and linguistic factors, as interpreted by the Court of Justice, ...".

It seems evident that, also taking into consideration the increasing of overweight and obese people in EU, the figure of the average consumer as the one to which information content of claims shall be referenced to, is too simplified and the aim to made information understood by as many consumers as possible is quite difficult to achieve.

Referring the comprehension of nutritional information only to a hypothetic consumer category leads to what in literature is well known as "halo effect" and "the magic bull effect" that occur when consumers generalize the health claim to believe that the product generally is healthy, whereas the health claim is only about a specific benefit. Both cases can be regarded as misleading consumers and therefore as a case of a lack of understanding (Grunert, *et al.*, 2011).

It is clear that the solution of the main problems encountered would create positive effects, especially with regard to the conflict of interests between consumers and producers and the correct functioning of the internal market.

3. The evolution of food consumption and eating habits in Italy

Despite being able to count on traditions and eating habits well-known all over the world and also partly relating to the Medi-

terranean diet, Italy, as much as other developed Countries, is affected by problems related to malnutrition, especially overweight and obesity.

With reference to the period 2005-2014, the Italian population showed a decrease in the percentage of normal-weight people (-3.8%) and an increase both in underweight people (+7.1%) and overweight (+4.0%) and obese (+4.0%).

Over the considered decade, normal-weight people decreased from 52.6% to 50.6%; underweight people increased from 2.8% up to 3.0%; overweight people from 34.7% to 36.1% and obese from 9.9% to 10.3% (ISTAT, 2015).

It should be noted that especially young people are underweight (9.3% aged between 18 and 24 and 5.6% between 25 and 34 years); while overweight and obese people are in the age group of 55 to 74.

The above mentioned data would suggest that, at present, one out of two Italians have an incorrect relationship with food and this can be due both to a lack of food education and the influence of fashion and advertising.

Already it should be noted that:

- the majority of underweight are young people whose behaviour is influenced by media model glorifying thinness;
- the majority of overweight and obese people are without school certificate or with an elementary diploma (45.2% of overweight people and 16.4 of obese) and 38.4% and 11.8% respectively with the only junior high school diploma;
- the highest incidence of normal-weight people (61.6%) and the lowest of overweight (27.9%) and obese (5.3%) people is among graduated and post-graduated people.

As it is known, underweight, overweight and obesity depend, in most cases, by an imbalance between energy input and consumption.

If the problem of underweight among young people can be explained with the influence of fashion and advertising, with regard to overweight and obesity, the cause lies with an excessive calorie intake which has itself been caused by eating habits – with prevalence of products of animal origins, greasy food, sweets, beverages and processed foods – and lifestyles.

Not surprisingly, overweight and obesity prevention is mainly based on the adoption of eating habits where the consumption of fruit, vegetable, legumes, whole grains and, more generally, fresh unprocessed foods is prevalent.

In view of this, data on eating habits and the evolution of consumption of certain categories of products need to be taken into account.

In the period 2005-2014, eating habits of Italians conflict with the increment of overweight and obese people.

On the basis of trends observed over the considered period, Italians' behaviour seems to be more coherent with prevention of overweight and obesity.

In particular, we are referring to:

- the reduction of the percentage of the people who, several times a week, eat bovine meat (-11.0%), pig meat (-4.6%) and cold cuts (-4.0%) and of those who eat, at least once a day, bread and pasta (-6.3%), milk (-8.1%) and cheese (-18.0%);
- the increase in the number of people eating green vegetables (+6.3%) and vegetables (+11.5%) at least once a day.

Opposite respect to an overweight and obesity prevention are trends regarding, at least once a day, the consumption of fruit (-4.8%) and, several times a week, snack (+11.8%).

Although important, these data cannot be considered with respect to their respective absolute value.

We must consider that, in 2014, bovine meats and cold cuts were eaten, several times a week, respectively by 64.7% and 59.2% of Italians, bread and pasta and milk were eaten, once a day, by 81.5% and 55.8% of Italian population and fruit, green

vegetables and vegetables by 73.6%, 52.0% and 45.5 respectively.

That just shows how, despite of the trends of eating habits might seem positive as regards overweight and obesity prevention, Italians' eating habits continuous to be skewed in favour of foods primarily responsible of malnutrition.

Whit this in mind, it is interesting that, among the different food industry sectors, the largest turnover belongs to those handling products of animal origin, especially milk and cheese, meat and processed meat products. Following, in order of importance, fruit and vegetable sectors; cacao; chocolate; candies; confectionery products; bread and manufacture of fresh pastry goods; rusks; biscuits and manufacture of preserved pastry goods; tea and coffee; pasta.

In the beverage sector, whose global turnover is about 18% out of foodstuffs, the main categories are: wines, soft drinks and bottled mineral water.

It is logic and it can be and expected datum, the fact that the most consumed products are those with a higher added value for food industry. What is more interesting to observe is the turnover of consumed products that, in most cases, do not reflect the above mentioned eating habits.

Except for milk, bread and dairy products sectors, where the reduction in the consumption reflect the contraction in turnover (-24.8% milk; -19.0% bread), the other sectors show different trends.

The processed meat sector and meat products, including cold cuts, have increased turnover of 4.9% and 13.7% respectively.

With regard to the main sectors of Italian food industry, some productions, not exactly indicated to combat overweight, increased their turnover such as: cacao; chocolate and confectionery products; rusks; biscuits and manufacture of preserved pastry goods; processed foods and soft drinks.

In this regard, it is interesting to note that sectors with the highest turnover are those with the highest level of industrialization too, expressed as the ratio between added value and production. With regard to this parameter, it is to point out that the impact of added value is maximum for more comprehensive production processes (confectionery, canning, beverage and ready meal sectors) and lowest in diary and milling sectors, where there are simplest production cycles.

It therefore appears significant and expression of the influence of advertising that the consumer preferences have been moving towards products with higher added-value to the food industry.

Not least, this consideration is endorsed by the results of a recent survey (Federsalus, 2015) showing that 80% of Italians have used at least one dietary supplement in the last year (+15% since 2012).

4. Conclusions

In developed Countries, the phenomenon of malnutrition occurs trough overweight and obesity. These problems affect a growing number of people and further increases are estimated in the future.

The consequences of this are the increase sanitary risks, the worsening of quality life expectance and huge costs to address the raising of health costs.

A better food education can be the best way to tackle the problem of overweight and obesity.

Lots of important information available to consumers are transmitted by advertising and foodstuffs labelling. These are strategic and commercial sensitive information able to create conflict of interests between producers and consumers.

EU has address recently the problem (2006) through a specific Regulation that, within the wider framework of the labelling rules, made provisions aimed at disciplining the use of health claims.

The main objective of the European Regulation is to ensure the effective functioning of the internal market whilst providing consumers with information of healthy characteristics of food.

Ten years after the introduction of Regulation on healthy claims, several studies on this matter showed that consumers pay more attention to the image of products than nutritional information. It follows that health claims, more than guarantee fair competition and better eating habits, helped to consolidate the role of food industry holding the strongest brands.

This is confirmed by the analysis of what has happened in Italy in the ten years from 2005 to 2014. In this period there has been an increase both of the number of overweight and obese people and the turnover of the main food industry sectors,

especially the ones with the highest added value for industry and less suited to a healthy eating.

Finally, it seems necessary an in-depth rethink of current tools of information to consumers also taking into consideration the recent orientations set up by UN for the decade 2016-2025 and the result of CLYMBOL project. According to these results, specific programmes aimed at promoting healthy eating habits must be put in place, in order to stop the phenomenon of overweight and obesity.

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References

- [1] **Bech-Larsen, T., & Grunert, K. G.** (2013), *The perceived healthiness of functional foods: A conjoint study of Danish, Finnish and American consumers' perception of functional foods*, *Appetite*, 40(1), pp. 9-14.
- [2] **Calabrò, G.** (2014), *Marketing Strategies for the Agri-Food sector: adaptation requirements and contradictions*, In Salomone R, Saija G (eds), *Pathways to environmental sustainability: methodologies and experiences*, Cham Heidelberg, New York, Dordrecht, London: Springer. pp. 43-53.
- [3] **Carels, R.A., Harper, J., Konrad, K.** (2006), *Qualitative perception and caloric estimations of healthy and unhealthy foods by behavioral weight loss participants*, *Appetite*, 46(2), pp. 199-206.
- [4] **Couto E., Ferrari P., Trichopoulou A., Spencer E., De Carli A., Gonzales C., Noethlins U., Boffetta P., Trichopoulos D.** (2008), *EJC, Supplements*, 6 (9), pp. 194.
- [5] **Croppenstedt, A., Barrett, C., Carisma, B., Lowder, S., Meerman, J., Raney, T. & Thompson, B.** (2013), *A typology describing the multiple burdens of malnutrition*, ESA Working Paper No. 13-02, Rome, FAO.
- [6] **Drescher, L., S., Roosen, J., Marette, S.** (2014), *The effects of traffic lights labels and involvement on consumer choices for food and financial products*, *International Journal of Consumer Studies*, 38 (3), pp.217-227.
- [7] Eurobarometer on sport and physical activity (2014), [online], Available at : <www.ec.europa.eu/eb_special_419_400_en> [Accessed 5 July 2016].
- [8] FAO (2015), *The State of Food Insecurity in the World 2015. Meeting the 2015 international hunger targets: taking stock of uneven progress*, Rome: FAO.
- [9] FAO (2016), *Food security indicators*, [online], Available at : <<http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.VxYJmtSLTGh>>, [Accessed 30 June 2016].
- [10] **Faulkner, GP., Pourshahidi, LK., Wallace, JMW., Kerr, MA, McCaffrey, TA and Livingstone MBE** (2014), *Perceived 'healthiness'. Of food can influence consumers' estimation of energy density and appropriate portion size*, *International Journal of Obesity*; Vol. 38, pp. 106-112.
- [11] FEDERSALUS (2015), *I key trends del mercato degli integratori alimentari*, [online], Available at www.federsalus.it, [Accessed 5 July 2016].
- [12] **Ferrís-Tortajada, J.; Berbel-Tornero, O.; García-Castell, J.; Ortega-García, J.A.; López-Andreu, J.A.** (2012), *Dietetic factors associated with prostate cancer. Protective effects of Mediterranean diet*, *Actas Urol Esp*, 36(4), pp.239-245.
- [13] **Gravel, K., Doucet, É., Herman, C.P., Pomerleau, S., Bourlaud, A., Provencher, V.** (2012), *"Healthy", "diet" or "hedonic". How nutritional claims affect food-related perception and intake?*, *Appetite*, 59, pp. 877-884.
- [14] **Groven, S., Kaouache, M., Rempel, P., Lawrence, J., Dawes, M., Lau, D. CW, Lowensteyn, I.** (2015), *Years of life lost and healthy life-years lost from diabetes and cardiovascular disease in overweight and obese people: a modelling study*, *The Lancet Diabetes & Endocrinology*; Vol. 3(2), pp. 114-122.
- [15] **Grunert, K.G, Scholderer, J., Rogeaux, M.** (2011), *Determinants of consumer understanding of health claims*, *Appetite*, 56, pp. 269-277.
- [16] **Hall, C., Osses, F.** (2013), *A review to inform understanding of the use of food safety messages on food labels*, *International Journal of Consumer Studies*, 37, pp. 422-432.
- [17] **Hieke, S., Kuljanic, N., Wills, JM., Pravst, I., Kaur, A., Raats, MM., van Trijp, HCM., Verbeke, W., Grunert, KG.** (2015), *The role of health-related claims and health related symbols in consumer behaviour: Design and conceptual framework of the CLYMBOL project and initial results*, *Nutrition Bulletin*, vol. 40 (1), pp. 66-72.
- [18] ISTAT (2015), *Statistiche prodotti agroalimentari*, [online], Available at <www.istat.it>. [Accessed 5 July 2016].
- [19] **Kolodinsky, J.** (2012), *Persistence of health labeling information asymmetry in the United States: historical perspectives and twenty-first century realities*, *Journal of macromarketing*, 32 (2), pp. 193-207.
- [20] **Kyureghian, G.** (2009), *Food Away From Home Consumption and Obesity: Is 'Average Consumer' a Myth or Reality*, *Agricultural & Applied Economics Association & The American Council on Consumer Interests Joint Meeting*, pp. 26-29, Milwaukee, Wisconsin, 26-29 May
- [21] **La Vecchia C.** (2006), *An overview of Italian studies of Mediterranean diet and cancer*, *Toxicology letters*, Vol. 164, p. 56.
- [22] **Lähteenmäki, L.** (2013), *Claiming health in food products*, *Food qual prefer*; no. 27, pp. 196-201.
- [23] **Lähteenmäki, L., Lampila, P., Grunert, K., Boztug, Y., Ueland, Ø., Åström, A., Martinsdóttir, E.** (2010), *Impact of health-related claims on the perception of other product attributes*, *Food Policy*, 35, pp. 230-239.
- [24] **Lalor, F., Madden, C., McKenzie, K., et al.** (2011), *Health claims on foodstuff: a focus group study of consumer attitudes*, *J Funct Foods*, 3 pp. 56-59.
- [25] **Oakes, M.E.** (2006), *Filling yet fattening. Stereotypical beliefs about the weight gain potential and satiation of foods*, *Appetite*, 46 (2), 224-233.
- [26] **Provencher, V., Polivy, J., Herman, C.P.** (2009), *Perceived healthiness of food. If it's healthy, you can eat more!*, *Appetite*, 52(2), pp. 340-344.
- [27] *Regulation (EC)No 1924/2006 of the European Parliament and of the Council on nutritional and health claims made on food* (OJ L 404, 30.12.2006, p. 9).
- [28] **Romaguera, D., Norat, T., Vergnaud, A. et al.** (2010), *Mediterranean dietary patterns and prospective weight change in participants of the EPIC-PANACEA project*, *The American Journal of clinical nutrition*, 92, pp. 912-921.
- [29] **Saba, A., Vassallo, M., Shepherd, R. et al.** (2010), *Country-wise differences in perception of health-related messages in cereal-based food products*, *Food Qual Prefer*, 21, pp.385-393.
- [30] **Sabbe, S., Verbeke, W., Deliza R., et al.** (2009), *Effect of a health claim and personal characteristics on consumer acceptance of fruit juices with different concentration of açai (Euterpe oleracea Mart.)*, *Appetite*, 53, pp. 84-92.

- [31] **Schröder, H.** (2007), *Prospective mechanisms of the Mediterranean diet in obesity and type 2 diabetes*, Journal of Nutritional biochemistry, 18, pp. 149-160.
- [32] **Scoditti, E.; Calabriso, N.; Massaro, M.; Pellegrino, M.; Storelli, C.; Martines, G.; De Caterina, R.; Carluccio, M. A.** (2012), *Mediterranean diet polyphenols reduce inflammatory angiogenesis through MMP-9 and COX-2 inhibition in human vascular endothelial cells: A potentially protective mechanism in atherosclerotic vascular disease and cancer*, Archives of Biochemistry and Biophysics, 527, pp 81–89.
- [33] **Smeets, P.,A.,M., van der Laan, L.** (2011), *Satiety. Not the problem, nor a solution. Comment on "Satiety. No way to slim"*, Appetite, 57, pp. 772-773.
- [34] **Sofi, F., Cesari, F., Abbate, R., Gensini, G.F., Casini, A.** (2008), *Adherence to Mediterranean diet and health status: meta-analysis*, British Medical Journal, 11 pp. 1-7.
- [35] **Todt, O., & Luján, J. L.** (2015), *The role of epistemic policies in regulatory science: scientific substantiation of health claims in the European Union*, Journal of Risk Research, pp. 1-15.
- [36] **Tremblay, M.S., Gray, C.E., Akinroye, K., Harrington, D.M., Katzmarzyk, P.T., Lambert, E.V., et al.** (2014), *Physical activity of children: a global matrix of grades comparing 15 countries*, Journal of physical activity & health, 11(S), pp. 13-25.
- [37] United Nations General Assembly (2015), *United Nations Decade of Action on Nutrition (2016-2025)*, A/70/L.42, 28 March 2016.
- [38] **van Trijp, H.C.M. and van der Lans, I.A.** (2007), *Consumer perceptions of nutrition and health claims*, Appetite, 48, pp. 305-324.
- [39] **Verbeke, W.** (2006), *Functional foods: consumer willingness to compromise on taste for health?*, Food qual prefer, 17, pp.126-131.
- [40] **Verbeke, W., Scholderer, J., & Lähteenmäki, L.** (2009), *Consumer appeal of nutrition and health claims in three existing product concepts*, Appetite, 52(3), pp. 684-692.
- [41] **Voinea, L.** (2012), *Food Patterns – Tools for guiding the Alimentary behavior of consumers*, Quality – Access to success; vol. 13 (131), pp. 94-98.
- [42] WHO (2015), *World Health Statistics 2015*, Geneva: World Health Organization.
- [43] WHO (2016), *Report of the Commission on Ending Childhood Obesity*, Geneva: WHO Library Cataloguing-in-Publication Data
- [44] **Wills, J.M., Bonsmann, S., Kolka, M. and Grunert, K.G.** (2012), *Nutrition and health claims: help or hindrance European Consumers and health claims: attitudes, understanding and purchasing behaviour*, Proceedings of the Nutrition Society, 71, pp. 229-236.
- [45] **Žeželj, I., Milošević, J., Stojanović, Z., Ognjanov, G.** (2012), *The motivational and informational basis of attitudes toward foods with health claims*, Appetite, 59, pp. 960-967.
- [46] **Zheng, X., Zhen, C.** (2008), *Healthy food, unhealthy food and obesity*, Economics Letters; 100, pp. 300-303.