


## Scientific trends of global food laws and regulations

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EDITORIAL

Founded in 2004 the Global Harmonization Initiative (GHI) is an international non-profit network of individual scientists and scientific organisations working together to enhance harmonisation of global food safety regulations and legislation. To promote the objective of GHI, to furnish sound fact-based advice to harmonise food law and regulations across the world, it was decided to publish a special issue on 'Scientific trends of global food laws and regulations'. Therefore, articles including issues of industrial, national, regional, international and global concern, especially to food and feed scientists, nutritionists, and health professionals were invited. The invited manuscripts consist of acts, regulations, standards, code of practices, guidelines, residue limits, laws, legislations, risk analysis, systems and policies for food security, food, feed and water safety, food, feed and water quality, nutrition, and health and wellness. Among all received manuscripts, nine articles ultimately were accepted to be published in this special issue.

In the first article Vintila *et al.* (2019) report on global nutrition policies according to the current trends of nutrition legislation across the world. They recommend harmonisation of dietary guidelines as well as nutritional and health claims as a new task for the Nutrition Working Group of the GHI. Consumers, through food quality and fair trade would benefit from the improvement and harmonisation of current scattered nutritional guidelines. For instance, the differences among major nutritional issues such as nutrient reference value, daily energy value and intake need urgent attention to be harmonised. The article also present harmonised checklist on food nutrition and health claims within the framework of the general principle of harmonisation. The authors recommend maximising the harmonisation process in the following directions:

- Preparing a unitary and transparent register of harmonised permitted nutrition and health claims.
- Guidelines for food claims for worldwide use.
- Exclusive use of the harmonised list of permitted nutrition and health claims in global trade description act(s).
- Appropriate global advertising rules for foods with nutrition and health claims.
- Promote the communication and understanding of scientific research results of validated methods of quantifying food constituents, with proven health effects for the end-user.
- Harmonisation of scientific reporting regarding study design, clinical practice, data analysis, statistical methods, results report, etc.

- Harmonisation of worldwide nutritional education and training.

As presented by Smith (2019), cleaning tools and utensils are very important causes of cross-contamination in food processing plants. Based on the results of UK founded research, about half of cleaning tools in the food industry is contaminated with *Listeria monocytogenes*. The results of the study were in agreement with those reported by Schäfer *et al.* (2017), who found that two third of utensils used in poultry processing plants were also contaminated this bacterium. Food safety schemes approved by the Global Food Safety Initiative draw attention to cleaning tools and utensils. The author reviews information provided by the British Retail Consortium (BRC), the International Standards Organization (ISO), and the Safe Quality Food (SQF) in terms of cleaning tools and utensils selection, hygiene and maintenance. The article focuses on hygienic design, construction, and the development of cleaning methods and the schedules of maintenance requirements as well as providing a guideline to comply with BRC, ISO, and SQF.

In the third paper, Arthur (2019) writes about the importance of regionalisation and globalisation in terms of enhancing food trade opportunities for African countries, both within the continent and with the rest of the world. The author put emphasis on the requirement of food standards harmonisation of African countries with international food standards to promote the participation

of these countries in the global food market and to direct trade into the continent. Additionally, the efforts and challenges for harmonisation of standards through the regional economic communities are discussed. The achievement of better uniformity and effectiveness is suggested by means of strengthening regulatory institutions, development of infrastructure and technical capacity, and coordinating the several harmonisation initiatives. Moreover, the author recommends that in parallel to build of an African reference laboratory, national governments should invest in strengthening standards-setting and regulatory institutions, and build capacity to develop the needed labour for analytical work. It was stressed that an enhanced continental laboratory will need strong national food systems to thrive.

In their article Nogueira and Ariseto-Bragotto (2019) report on the food additives information declared on the label of Brazilian meat products. On the 192 labels of locally produced meat products, 40 food additives are declared, in which sodium nitrite, carmines, and pentasodium triphosphate are the most reported additives with a numerical acceptable daily intake (ADI). Sodium erythorbate, monosodium L-glutamate, and sodium lactate are the most cited additives with no limited or no specified ADI. Sausages, salami, Bologna and frankfurters contain the highest number of additives. Despite some irregularities regarding the form of declaration of additives on the label, almost all additives presented on the label are permitted for use in meat products category. The authors also put emphasis on the disharmony of the maximum limits permitted for the use of additives in various countries. Although the study may be useful for future inspection and monitoring actions, it is worth mentioning that no laboratory analysis was performed in the present study to verify the authenticity of the data declared on the labels and the compliance with maximum limits permitted for each additive.

Popa *et al.* (2019) present the shelf life and the best storage practices for high quality organic strawberries. They stored organic strawberries in four various conditions: air (control); 5% O<sub>2</sub>, 10% CO<sub>2</sub>, 85% N<sub>2</sub>, 75% relative humidity (CA I); 5% O<sub>2</sub>, 15% CO<sub>2</sub>, 80% N<sub>2</sub>, 75% relative humidity (CA II) and 5% O<sub>2</sub>, 10% CO<sub>2</sub>, 85% N<sub>2</sub>, 95% relative humidity (CA III). Despite some losses of valuable compounds such as ascorbic acid and polyphenols, they note that from physical-chemical, microbiological and nutritional points of view the best storage conditions in controlled atmosphere of the examined organic strawberries are 5% O<sub>2</sub>, 15% CO<sub>2</sub> and 80% N<sub>2</sub> with a 75% relative humidity at 3 °C. This advantage is very important taking into consideration seasonal characteristics of this fruits.

Legume *Vigna mungo* that is widely cultivated and serves as an economical and important source of nutritious

components in South Asian countries suffers from the non-nutritional factors in the pulse. Batra *et al.* (2019) report the usage of lactic acid bacteria as an effective and adaptable method for reducing non-nutrients in this kind of legume. They designed a simple fermentative method at ambient temperature for reducing trypsin inhibitor, cyanide, saponin, raffinose series oligosaccharides, tannin and phytate in *V. mungo*. They revealed that after 4 h, an indigenous strain of *Lactococcus lactis* in *V. mungo* and cereal (wheat) composite flour reduced the phytate and saponin by 69 and 81% respectively, and removed them completely in 8 h. Hydrogen cyanide, tannin and amylase inhibitor were also degraded completely whereas trypsin inhibitor decreased by 41% within 4 h and raffinose series oligosaccharides were declined by 65% after 4 h. Chemical composition of the legume remained intact after the fermentation and the cell viability and production of gamma aminobutyric acid by *L. lactis* in the composite sourdough remained unaltered over this process. They concluded that this fermentation method could be considered as a promising strategy to increase utility, safety and enhanced nutritional benefits of *V. mungo*.

Zhang *et al.* (2019) write down how the public integrates their cognition and experience into their food products information behaviour strategies in China. They believe that purchase decisions of consumers affect the management decision of food enterprises and the regulation strategy of governments. They claim that despite the existence of several food standards in China, an appropriate supply of food information for consumers is lacking. In addition, they investigated the public's behaviour towards food quality standard information through structural equation modelling. The impactful parameters on the public's cognition of food quality standard information and its influence on purchase decisions were studied. They summarise that the satisfaction of Chinese consumers and their reliance on food quality standard information are not high, the usage of the information is dramatically low and the vast majority of the participants are not provided with relevant knowledge or training. Based on the results of their study they propose policy suggestions from the perspective of information demand and to explore methods for reducing information asymmetry in the food industry. They suggest investigating the interactions between food brand information, import and export information on food quality standard information in future.

*Sorghum oryzoidum* (soryz) as a gluten-free cereal was studied to develop gluten-free products. Culetu *et al.* (2019) compare the rheological behaviour of soryz in terms of thermo-mechanical properties, assessed by the Mixolab system, to rice, oat, teff, quinoa, and soy. They reveal that soryz shows an atypical Mixolab curve with very low consistency in temperatures below the gelatinisation temperature. Moreover, soryz presents a weaker protein

network, a lower water absorption and less stability than other flours. They report a positive correlation between protein weakening and dough stability ( $r=0.88$ ;  $P<0.05$ ). High starch swelling and, consequently, starch retrogradation, and increased starch gelatinisation are typical specifications of soryz flour. They demonstrate a positive correlation between starch content and gelatinisation ( $r=0.76$ ;  $P>0.05$ ), while a negative correlation was found between starch gelatinisation and protein content ( $r=-0.66$ ;  $P>0.05$ ) as well as lipid content ( $r=-0.77$ ;  $P>0.05$ ) of the gluten-free flours. In comparison with bread control, by the addition of soy flour in soryz bread formulations the bread volume, porosity and lightness decreased whereas hardness increased. They suggest 10% soy addition in bread formulations to improve bread nutritional value without deteriorating the sensorial properties.

In India, consumption of traditional indigenous preparations (IPs) comprising of herbal ingredients that reportedly contains phytoestrogen has been a dietary practice during pregnancy for begetting a male child. In the final paper, Rai *et al.* (2019) investigate the prevalent bioactive components in IPs and their chemical identities collected from various geographical regions of India. Thin layer chromatography and reverse phase high performance liquid chromatography were used to determine selected phytoestrogens such as genistein, daidzein, formononetin, and biochanin A. Presence of steroids was tested through Liebermann-Burchard test. They report that more than two third of the tested IPs used for sex selection contained isoflavones and steroids. They recommend that the consumption of IPs during pregnancy could be of importance in terms of safety to both mother and embryo. They suggest *in vivo* experiments using established higher mammalian models like rodents to provide strong evidence and scientific explanation on the outcomes of consumption of these samples in future.

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