Review

Does European Union food policy privilege the internet market? Suggestions for a specialized regulatory framework

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ABSTRACT

The online food and beverages market has grown rapidly over the past decade and a considerable number of consumers conduct their weekly grocery shopping over the internet. However, in the European Union the online distribution channel has been neglected in regard to food safety, and is even privileged in some aspects, as online shops are not necessarily subjected to inspections, while sampling and analysis is often complicated as the demands in regulation (EC) No 882/2004 cannot be completely fulfilled in distance selling circumstances. For example, the food operator's right to apply for a supplementary expert opinion may be infringed. A literature review shows that this lack of control is evidenced by a prevalence for misleading advertising (especially for nutritional supplements), but may also cause consequences for the health of the consumers (e.g. missing labelling of allergens, microbiological risk if the cooling chain is broken during transport, chemical risk if non-approved ingredients are used or contamination occurs). A solution would be a policy framework that specifically targets the internet market. The mandatory food information should be clearly pointed out on the product web-pages before the purchase is concluded. The food safety authorities should be granted the right to sample products by online order, which also needs to be possible anonymously in cases of reasonable suspicion.

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1. Introduction

As early as 1977, Isaac Asimov predicted that the year 2025 would see a kind of computerized convenience store, in which the
customer will call the store by using his own computer, and make his grocery list. The order will automatically be picked off the shelves of a computerized warehouse, packed, and ready for pickup by car (Asimov, 1977). This vision became reality earlier than predicted, and today's internet customer has not even to use his car for pickup as the order will be delivered right to his doorstep. Since its humble beginnings in the early 1990s, shoppers have greeted the introduction of online grocery shopping with enthusiasm as the solution for their time pressure problems (Datamonitor, 2002). During the economic crisis in 2009–2010, it was observed that many bricks and mortar stores were struggling whilst online businesses continue to prosper, suggesting that many consumers are making a shift towards the online retail format (Datamonitor, 2010a). In the UK, online food and grocery sales have grown rapidly over the past decade but now reach saturation, and a fifth of consumers do their weekly food & grocery shop online in 2010, which is now seen as the norm rather than the exception (Datamonitor, 2010b).

Our own observations of the German situation confirm this enormous growth of the internet market over the last decade. For example, less than 2000 products were offered in the food category of ebay.de in 1999, while today more than 150,000 products are available (Fig. 1). An online food and beverages shop was launched by amazon.de in July 2010, offering approximately 42,000 items online, selling and distributing these grocery goods through partners (Heinemann & Schwarzl, 2010). Till July 2012, the platform has quickly grown and now offers over 175,000 items.

Besides the changes in the quantity of the market, there was also a considerable change in quality. At the beginning of online shopping in the 1990s, the market was dominated by specialty foods and a large percentage of alcoholic beverages (over 80% of all foods on ebay.de were alcoholic beverages till 2000). Besides specialty foods that were not easily available in local stores, the market concentrated on food groups that were relatively stable and had a long shelf-life (i.e. alcohol and nutritional supplements). Today, the market has more and more shifted towards offering the standard line of products available in every supermarket, and the percentage of alcoholic beverages has been considerably lowered to about 30%. The quantity of food items offered at the major platforms in Germany (ebay.de and amazon.de) has exceeded a number of 250,000, and as we will point out in this article the regulator clearly lacks behind in control of this vast internet market. The offering of perishable groceries over the internet has also led to the emergence of new problems, e.g. microbiological risks (Löbell-Behrends et al., 2010). While the general European Union regulations require that a high level of protection of human health and consumers' interest in relation to food should be assured, and that all stages of production, processing and distribution should be encompassed (European Parliament & European Council, 2002), the online distribution is clearly an area that has so far been neglected in regard to food safety. On the contrary, the internet food market is even privileged in some aspects. While conventional supermarkets are regularly subjected to inspections, which includes sampling and analysis, an internet shop is currently not controlled in this depth—if at all. This article is based on a literature review about the problems of the online marketing and sale of foods, and corresponding policy requirements with the aim to point out suggestions that would provide a similar level of food safety for internet purchasers than for those consumers buying at conventional retail sale.

### 2. Methods

A computer-assisted literature search was conducted using the following key word combination: (internet, online, network OR web) AND (marketing, sale, shop, policy, control, surveillance, law, regulation, directive OR government) AND (food, beverages, drinks, grocery OR nutritional supplement).

Searches were carried out in March 2011, in the following databases: PubMed (U.S. National Library of Medicine, Bethesda, MD), Web of Science (Thomson Reuters, Philadelphia, PA), and Scopus (Elsevier B.V., Amsterdam, the Netherlands). This was accompanied by a hand search of the extensive literature collection of the authors as well as of the reference lists of all selected articles for any relevant studies not included in main database search.

English was the main language of the electronic databases; however, there were no language restrictions and authors were able to review articles in English, French, Spanish, Portuguese, German, and Russian. The references, including abstracts, were imported into Reference Manager V.12 (Thomson Reuters, Carlsbad, CA) and the relevant articles were manually identified and obtained in full text.

The inclusion criteria were:

1. Article must contain data on marketing or sale of foods over the internet and related electronic media (e.g. social networks).
2. Article must include data on either general problems related with internet marketing or specific control or policy options.

Clearly misclassified papers were directly excluded (e.g. studies exclusively dealing with prescription medicines or illicit drugs).

Furthermore, the current EU policy on distance selling of foods was identified by searching the EUR-Lex database (Publications Office of the European Union, Luxembourg).

### 3. Results

Many of the articles identified from the search belong to a "policy need" category, meaning that they identified certain problem areas related to food marketing or trade on the internet and concluded that there was a need for food policy measures or interventions (hence the inclusion of these keywords in the articles). However, only very few of these articles did provide concrete suggestions about exactly what policy measures were recommended in terms of implementation or cost-benefit. However, we did not completely exclude these “policy need” articles from our

![Fig. 1. Number of items sold in the food category of ebay.de. The columns show the total number of food items as well as the proportion of alcoholic beverages. The error bars represent the standard deviation between two different observations per year (January and August if available). The data for 1999–2009 were taken from Internet Archive Wayback Machine (www.archive.org), search conducted in September 2011. Data for 2010–2012 were taken from direct searches at http://feinschmecker.shop.ebay.de in these years.](image-url)
literature list, as they provided interesting topical information about the diversity and scale of the problem.

The articles can be further grouped into two broad categories. The first category refers to all food products in general, the second category refers to problems specific only to certain food groups such as nutritional supplements. The results of the literature review are summarized in Tables 1 and 2. Besides a short descriptive of the problems identified in the studies, the tables specifically summarize the policy suggestions (if any) that were provided by the authors.

3.1. Internet trade with foods in general

Much of the literature revealed by our review deals about general aspects of consumer research and marketing of food products over the internet (e.g. Chu, Arce-Urriza, Cebollada-Calvo, & Chintagunta, 2010; Grunert & Ramus, 2005; Lynch & Ariely, 2000; Morath & Doluschitz, 2002; Morganosky & Cude, 2002; O’Keeffe, 2001; Peterson, Balasubramanian, & Bronnenberg, 1997; Phau & Poon, 2000). The marketing literature generally assumes that a benefit for the consumer arises, such as better information search facilities, lower prices, added convenience due to home shopping, delivery and automated shopping list facilities, better ability to find preferred brands, or more information about credence characteristics (Grunert & Ramus, 2005). Only few authors have pointed out the risks arising from internet trade, but “risk” in this case was typically restricted to the economic risk for businesses in losing market shares to internet vendors (Heinemann & Schwarzl, 2010; O’Keeffe, 2001). Only Grunert and Ramus (2005) also pointed out some potential negative effects of shopping for food via the internet for consumers, such as unreliable delivery, misuse of credit cards and personal information, higher prices, or lack of personal inspection of products. This was confirmed in a review of wine-buying consumers, which perceived financial risk as the major problem related to online shopping (Bruwer & Wood, 2005). Lang (1997) additionally pointed out that marketing material on the web may be liable for failing to provide accurate product information, especially in relation to foods, which may only contain claims that can be substantiated and that are not deceptive or misleading in any respect. None of the marketing literature, however, suggested food safety aspects as an inherent problem of the internet market, nor was any need for policy arising from this new form of marketing pointed out.

Not only in the marketing literature but also in the scientific literature in general, there is an absence of information about food safety and policy aspects of the internet market with foods. Only the Federal Office of Consumer Protection and Food Safety (BVL), which is the management authority for health-related consumer protection in Germany, has suggested some concepts to improve the control of the internet food trade (Kuhr & Schreiber, 2009; Tschiersky-Schöneburg, 2009):

1. Implement a central authority that systematically researches the food advertising and sale on the internet and that informs the local authorities responsible for enforcing the food law if the central authority detects offences against food laws.
2. Detect vendors that have no registration as food vendor, and are therefore not known to the food control authorities [apparently many vendors are not aware of the mandatory obligation to register as food business according to regulation (EC) No 852/2004 (European Parliament & European Council, 2004a)].
3. Inform the consumers about the risks of internet purchase of foods.
4. Implement an EU-wide consistent policy for internet control.

The overview in Table 1 shows that the most important aspect to be considered for such an EU-wide policy framework is the food information, which should meet the same level of detail on the

<table>
<thead>
<tr>
<th>Country</th>
<th>Problem</th>
<th>Policy option</th>
<th>References</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>Any food supplied through distance selling should meet the same information requirements as food sold in shops</td>
<td>Clarify that the relevant mandatory food information should also be available before the purchase is concluded</td>
<td>European Parliament and European Council (2011)</td>
<td>Art. 14 of the regulation (EU) 1169/2011 on the provision of food information to consumers provides some guidelines, but the text is rather unclear. Structures for enforcement may be established as secondary step, after the actual policy has been established</td>
</tr>
<tr>
<td>EU</td>
<td>Structures and concepts are missing to systematically control the internet market</td>
<td>Establish a central federal agency for this purpose</td>
<td>Neuhaus (2010)</td>
<td>Currently compliance with food laws is not included in the criteria for certification Clarify regulation (EC) No 882/2004</td>
</tr>
<tr>
<td>EU</td>
<td>Identification of legitimate online shops by the consumer is not possible</td>
<td>Certification of online shops, “seal of approval”</td>
<td>Anon. (2011)</td>
<td></td>
</tr>
<tr>
<td>EU</td>
<td>A sampling of food items sold over the internet for governmental control purposes is often not possible</td>
<td>New laws for sampling are required, e.g. allowing government authorities to conduct sampling by online order, also anonymously in cases of reasonable suspicion</td>
<td>Böse et al. (2011)</td>
<td></td>
</tr>
<tr>
<td>EU</td>
<td>Registries of food vendors do not show if online trade is conducted. Online vendors often do not know about the obligatory registration requirement if they sell foods</td>
<td>Specific registry for online food vendors is needed</td>
<td>Kuhr and Schreiber (2009); Löbell-Behrends et al. (2011); Tschiersky-Schöneburg (2009)</td>
<td>Clarify regulation (EC) No 852/2004</td>
</tr>
<tr>
<td>Australia</td>
<td>Greater prevalence of high-level health claims and therapeutic claims made on the internet including a high proportion of non-compliant claims</td>
<td>Websites need to be monitored by regulatory agencies</td>
<td>Dragicevich, Williams, and Ridges (2006)</td>
<td>Enforcement needs to be necessary besides monitoring</td>
</tr>
<tr>
<td>EU</td>
<td>Private importation of unsafe goods</td>
<td>No possibility for intervention by authorities. Authorities should concentrate on consumer warning, education and information about the problem</td>
<td>Klindt (2001)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2
Overview of literature identifying problems and policy options regarding internet marketing and sale of specific food groups.

<table>
<thead>
<tr>
<th>Food group</th>
<th>Country</th>
<th>Problem</th>
<th>Policy option</th>
<th>References</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritional supplements</td>
<td>EU</td>
<td>A significant proportion of the supplement market is distributed via the internet (hence absent from routine border control and surveillance)</td>
<td>Need for better quality control, compliance and public awareness</td>
<td>Petrocci et al. (2011)</td>
<td>No specific policy options suggested</td>
</tr>
<tr>
<td>Ethnic/exotic food</td>
<td>EU</td>
<td>A higher risk for the consumer is generally assumed, especially microbiological risk</td>
<td>Improved importation controls</td>
<td>Gianfaldoni and Guidi (2008); Grabowski and Klein (2010)</td>
<td>No specific policy options suggested</td>
</tr>
<tr>
<td>Nutritional supplements for athletes</td>
<td>EU/Japan</td>
<td>Contamination with substances from the World Anti-Doping Agency list</td>
<td>Improvement of manufacturing standards</td>
<td>Geyer et al. (2000); Judkins et al. (2010); Okano et al. (2009)</td>
<td>No general population-scale problem</td>
</tr>
<tr>
<td>Nutritional supplements</td>
<td>EU/Brazil/USA</td>
<td>Intentional addition of pharmacologically active substances without declaration (e.g. for “doping” in sports foods or synthetic agents in herbal supplements for slimming)</td>
<td>None pointed out</td>
<td>de Carvalho et al. (2011); Kohler et al. (2010); Löbell-Behrends and el-Atma (2011); Müller et al. (2009); Nguyen et al. (2006)</td>
<td>No specific policy options suggested</td>
</tr>
<tr>
<td>Foods targeting children</td>
<td>USA, Canada</td>
<td>Promotion of foods with questionable nutritional profiles using viral marketing or persuasion through games, no mechanism to limit exposure</td>
<td>Revisions of industry self-regulation guidelines</td>
<td>Brady et al. (2010); Lee et al. (2009); Moore and Rideout, (2007)</td>
<td>A broader policy than self-regulation appears to be needed</td>
</tr>
<tr>
<td>Food for athletes and sportsmen</td>
<td>EU</td>
<td>Herbal products are regularly advertised with scientifically unproven claims. Pharmaceutically active synthetic substances may be added illegally</td>
<td>None pointed out</td>
<td>Löbell-Behrends, Schweizer et al. (2008)</td>
<td></td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>EU</td>
<td>The internet mail-order sale of alcohol lacks youth protection</td>
<td>Face-to-face control to ensure that no alcohol is sold to minors. Use of age verification systems to access web-pages marketing and selling alcohol</td>
<td>Böse et al. (2010)</td>
<td></td>
</tr>
<tr>
<td>Perishable groceries</td>
<td>EU</td>
<td>The cooling chain may be broken during transport. Microbiological risk for the consumer. Directive 97/7/EC excludes products that are liable to deteriorate or expire rapidly from the right of withdrawal</td>
<td>Amend directive 97/7/EC</td>
<td>Löbell-Behrends et al. (2011); Löbell-Behrends et al. (2010)</td>
<td></td>
</tr>
<tr>
<td>Nutritional supplements (dietary</td>
<td>EU</td>
<td>More than 300 products were evaluated, from which only 30% were in compliance with food laws. Deficits include misleading claims or non-approved ingredients</td>
<td>Test purchase is often required for final judgement about a product</td>
<td>Lachenmeier et al. (2012); Löbell-Behrends, Maixner et al. (2008)</td>
<td>Sampling and analysis is necessary</td>
</tr>
<tr>
<td>supplements, anti-ageing products</td>
<td></td>
<td>breached</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcoholics beverages</td>
<td>EU</td>
<td>Advertisement with misleading messages or legally forbidden health claims. Violations of industry’s self-regulation code regarding alcohol advertisements. Violations against EU flavour regulations (e.g. thujone in absinthie)</td>
<td>Improved controls. Legally binding policy regarding alcohol advertisements is needed</td>
<td>Löbell-Behrends et al. (2008)</td>
<td></td>
</tr>
<tr>
<td>Alcoholics beverages</td>
<td>USA, Australia</td>
<td>Unrestricted advertisements targeted at underage consumers, especially on social networks</td>
<td>Youth protection necessary. New policies regarding alcohol advertising are needed. Monitoring of web marketing practices necessary</td>
<td>Carroll and Donovan (2002); Mart et al. (2009)</td>
<td></td>
</tr>
<tr>
<td>Herbal Products</td>
<td>USA, EU</td>
<td>Potentially unsafe herbal products are marketed on the internet (e.g. essential oils)</td>
<td>More strict regulations, e.g. quality standards of dietary supplements</td>
<td>Ashar, Miller, Getz, and Pichard (2003); De Smet (2004); Jordan and Haywood (2007); Weisbord, Soule, and Kimmel (1997)</td>
<td>Problems with classifications often arise in this “borderline” area, e.g. products not approved as food or medicine may be marketed for “aromatherapy” The option appears naive, when most customers search on google</td>
</tr>
<tr>
<td>Herbal supplements targeted to</td>
<td>USA</td>
<td>Unlawful claims of disease prevention, treatment and cure found on the majority of surveyed commercial sites</td>
<td>Web search portals that help the user to filter out inaccurate or misleading sites should be used</td>
<td>Bonakdar (2002)</td>
<td></td>
</tr>
<tr>
<td>cancer patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietary supplements</td>
<td>USA</td>
<td>Unsubstantiated, misleading claims against FDA ruling. No need to provide evidence of safety or efficacy prior to marketing</td>
<td>Current system of regulation of advertising for dietary supplements has not been working</td>
<td>DeAngelis and Fontanarosa (2003); Morris and Avorn (2003)</td>
<td></td>
</tr>
<tr>
<td>Dietary supplements</td>
<td>USA</td>
<td>Potential for chronic toxicity and poisoning if overdosed</td>
<td>Policy for web sales of hazardous products needed</td>
<td>Gold and Slone (2003); Pauzé and Brooks (2007)</td>
<td></td>
</tr>
</tbody>
</table>
Internet search and legal evaluation of nutritional supplements marketed on the internet.

3.2. Internet trade with specific food groups

3.2.1. Foods targeted to children

Special marketing practices were pointed out for foods targeted to children (e.g. adver-games), which could promote unhealthy eating habits and obesity (Brady, Mendelson, Farrell, & Wong, 2010). While several online marketing practices of public policy relevance were identified in this area (Moore & Rideout, 2007), the empirical studies available were not able to identify the impact of these advertising practices on the behaviour of children. The authors of the studies were unanimous that more research is needed to formulate evidence-based decisions (Brady et al., 2010; Lee et al., 2009; Moore & Rideout, 2007).

3.2.2. Nutritional supplements

From the specific food groups, nutritional supplements appear to be the most problematic group of products on the internet, and are also the best researched group of foods (Table 2). The problem here is twofold. The first problem is the advertisement with claims (typically health or disease claims) that are misleading or scientifically unproven, despite regulations prohibiting such statements (European Commission, 2012; Morris & Avorn, 2003). The second problem comprises products that contain unapproved ingredients, typically pharmaceutically active compounds that are normally restricted to prescription medicines (Lachenmeier et al., 2012). Sometimes these ingredients are even introduced without the knowledge of the consumer, for example to “enhance” the effectiveness of herbal slimming supplements. Synthetic substances were, for example, added to herbal weight loss supplements (Nguyen, Ormiston, Kurani, & Woo, 2006). Confirming a previous report (Müller, Weinmann, & Hermanns-Clausen, 2009), our own institute detected sibutramine, an oral anorexiant known to cause severe adverse effects and which was withdrawn from the market as medicinal product, in several “herbal” slimming teas and coffees (Löbell-Behrends & el-Atma, 2011; Monakhova et al., in press). Besides slimming products, so-called anti-ageing products are prevalent for misleading claims on the internet (Löbell-Behrends, Maixner et al., 2008; Perls, 2004). It was remarked that potential hazards posed by nutritional supplements may not be accurately, if at all, represented on internet websites selling these products (Jordan & Haywood, 2007). An interesting aspect is that even spam (i.e. unsolicited e-mail) may contain offers of herbal nutritional supplements with purported health claims (Gernburd & Jadad, 2007). Own studies conducted in 2007 detected severe deficits in control, signified by the fact that about 2/3 of the products that were researched in the nutritional supplement category would have not been marketable in the conventional trade, as they were in deviation of at least one food regulation (Löbell-Behrends, Maixner et al., 2008). For the current article, we confirmed this finding by a new search in 2010, which revealed that 67% of the researched products were again suspicious for infringement of one or several regulations (Table 3).

Previous research also confirmed that a large proportion of the supplement market is sold exclusively via the internet, often by companies outside the EU and reaches consumers via the postal service, where goods are not subjected to safety checks (Löbell-Behrends, Kuballa et al., 2008; Löbell-Behrends, Maixner et al., 2008; Löbell-Behrends, Schweizer et al., 2008; Petroczi, Taylor, & Naughton, 2011).

Finally, it was pointed out that professional athletes should be careful regarding the use of nutritional supplements from the internet, as they were found to regularly contain substances from

### Table 2 (continued)

<table>
<thead>
<tr>
<th>Food group</th>
<th>Country</th>
<th>Problem</th>
<th>Policy option</th>
<th>References</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary supplements</td>
<td>USA</td>
<td>Herbal dietary supplements are marketed on the web for recreational purposes as alternatives to illicit drugs of abuse</td>
<td>Even after FDA bans of certain substances, websites continued to sell them</td>
<td>Dennehy, Tseourounis, and Miller (2005)</td>
<td></td>
</tr>
<tr>
<td>Dietary supplements</td>
<td>USA</td>
<td>Products are offered by unsolicited e-mail (spam)</td>
<td>Current regulatory, legal, and geographic boundaries may be unable to contain the flow of products around the world</td>
<td>Gernburd and Jadad (2007)</td>
<td></td>
</tr>
<tr>
<td>Boderline products (foods, cosmetics, medicines)</td>
<td>EU</td>
<td>No state control if the consumer orders products in third countries</td>
<td>Consumer education is the only means of protection</td>
<td>Butschke and Droh (2010)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3

Internet search and legal evaluation of nutritional supplements marketed on the internet.

<table>
<thead>
<tr>
<th>Time of search</th>
<th>November 2007</th>
<th>August 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search depth</td>
<td>Comprehensive 200 h search on google.de and diverse shopping sites for all products with keywords “slimming”, “cellulite” and “supplement”a</td>
<td>Quick repetition of search on google.de (only the first 20 results pages were evaluated)</td>
</tr>
<tr>
<td>Number of identified products</td>
<td>325</td>
<td>51</td>
</tr>
<tr>
<td>Without obvious complaint</td>
<td>37%</td>
<td>33%</td>
</tr>
<tr>
<td>Reasonable suspicion to be medicine (without approval)b</td>
<td>24%</td>
<td>16%</td>
</tr>
<tr>
<td>Novel food ingredient (without approval)</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>Other suspicions (e.g. misleading claims or health claims, additives without approval)</td>
<td>21%</td>
<td>43%</td>
</tr>
</tbody>
</table>

a Search conducted in German. See Löbell-Behrends, Maixner et al. (2008) for details on methodology and results for 2007. For the expert opinion-based evaluation process about the legal product status also see decision tree in Löbell-Behrends et al. (2011).

b For a final judgement about the legal status of products advertised on the web — especially for borderline products between foods and medicines — a sampling and chemical analysis would often be required.
the World Anti-Doping Agency list, either as contamination or as intentional addition (Geyer, Mareck-Engelke, Reinhart, Thevis, & Schänzer, 2000; Judkins, Teale, & Hall, 2010; Okano, Sato, Ikekita, & Kageyama, 2009). Anabolic steroids were reported as being the most common contaminations, occurring in 25% of supplements (Petroczi et al., 2011). The majority of “sports food” marketed on the web was either found to be ineffective and misleadingly labelled, or if effective they contained pharmaceutically active substances, which are not approved for food use (Löbell-Behrends, Schweizer et al., 2008).

3.2.3. Alcoholic beverages

Besides nutritional supplements, alcoholic beverages were pointed out as a product group that poses special problems on the internet market. It is of note that at least in the European Union, alcoholic beverages are included and regulated by food laws and therefore will be shortly included in this review. The problem arises from the fact that the internet provides an opportunity for alcohol marketing targeted at underage consumers, and that some alcohol-related web-pages would be in breach of industry’s voluntary advertising codes if those were applied to the internet (Carroll & Donovan, 2002; Löbell-Behrends et al., 2008). More specifically, social networks were pointed out to promote alcohol to minors without any regulation (EUCAOM, 2009; Mart, Mergingdoller, & Simon, 2009). Besides the pure marketing aspects, internet shops were also found to potentially sell alcohol to minors, as neither on the websites nor during the postal delivery process an age-verification is conducted (Böse, Löbell-Behrends, Marx, & Lachenmeier, 2010).

3.2.4. Perishable groceries and animal-based foods

Further problems include the internet sale of perishable groceries, which could lead to microbiological risks because the cooling chain may be broken during transport (Löbell-Behrends et al., 2010). This problem is especially evident if meat or other animal-based foods are directly ordered from third countries (Grabowski & Klein, 2010). The problem is that the end consumer acts as importer in such cases. The risk is especially high if products are purchased in countries where the inspec toral control is not efficient or even absent (Gianfaldoni & Guidi, 2008). If the value of the package falls below a certain limit, no custom’s control is conducted when the delivery enters the European Union. Therefore, the end consumer should be aware that the level of food safety could be considerably lower for such directly imported products.

The consumer should be also aware that the distance sale of perishable goods is another area, in which the European law privileges the supplier and restricts the protection of consumers. In general, a right of withdrawal is granted for any distance contract. As specified in Art. 6 of directive 97/7/EC, the consumer can withdraw from the contract without penalty and without giving reasons during a period of at least seven working days (European Parliament & European Council, 1997). However, the same article specifies an exception of this right, which is not granted in respect of contracts for the supply of goods, which, by reason of their nature are liable to deteriorate or expire rapidly (European Parliament & European Council, 1997).

At least, this is one area where solutions appear to be developed. For example, the delivery of perishable goods by special parcel services that guarantee an unbroken cooling chain till delivery to the consumer appears to be necessary, and such logistics are currently under development in Germany. As alternative, automated pickup terminals could be envisioned, at which the parcel is cooled till pickup by the customer. Such a system could also implement different cooling zones depending on the type of food (e.g. deep-freeze, and cooling at different temperatures) (Morath & Doluschitz, 2002). For these reasons, we think that the above mentioned EU directive should be amended, so that the risks arising from distance selling of perishable goods should be borne by the supplier and not by the consumer.

4. Discussion

Our literature research has identified two major problems of the internet trade of food: a lack of consumer information about the risks and a lack of possibilities for governmental control by sampling and analysis. As these two areas apply to all foods in general, we want to focus our discussion on these topics. All other aspects are secondary to these major demands, as e.g. the misleading labelling of nutritional supplements would be subjected to controls when sampling and analysis would be conducted (which also includes labelling controls). Only the two areas of youth protection (i.e. the promotion of unhealthy eating habits) and alcohol consumption would probably need separate regulations, but as youth control falls to a different policy area, we will not discuss these aspects but focus purely on food policy.

4.1. Improvement of information for consumers buying food products over the internet

Until recently, the European Union laws did not include any specific legislation about the internet market with food. The former labelling regulations (e.g. regarding ingredients or allergens etc.) did apply only to the labelling of packages and could not directly transferred to demand the same degree of consumer information on food product web pages. The policy maker in the European Union was apparently aware of this major problem as it is considered in regulation (EU) No 1169/2011 of the European Parliament and of the Council on the provision of food information to consumers (European Parliament & European Council, 2011). In the recital No. 27, it is stated that any food supplied through distance selling should meet the same information requirements as food sold in shops. Furthermore, it is necessary to clarify that in such cases the relevant mandatory food information should also be available before the purchase is conducted. Article 14 of the regulation then specifies requirements for “distance selling”. The mandatory food information (i.e. the name of the food, the list of ingredients including ingredients or processing aids causing allergies, the quantity of certain ingredients, the net quantity of the food, any special storage conditions and/or conditions of use, the name and address of the food business operator charging the consumers for supplements etc.) shall be available before the purchase is concluded and shall appear on the material supporting the distance selling or be provided through other appropriate means clearly identified by the food business operator. When other appropriate means are used, the mandatory food information shall be provided without the food business operator charging the consumers for supplementary costs.

To all appearances, the sale of foods over the internet would be subject to this requirements for “distance selling” (which is a term not defined in the regulation). We completely agree with the recital that the same information should be provided on the internet than as for food sold in shops. However, the text of Art. 14 is too ambiguous to fulfill this demand. On the one hand, the presentation on “normal” food packages should be marked in a conspicuous place in such a way as to be easily visible and clearly legible (Art. 13 of regulation 1169/2011), but this demand was not transferred to the “distance selling”, where the food information can even be provided by “other appropriate means” without defining what such means could be. This undefined regulation poses the risk that
information essential for the consumer (e.g. the use of additives, or presence of allergens) would be hidden in the “fine print”. For example, at the bottom of a webpage, which is visible only after several times of scrolling, or it could be moved even to secondary pages requiring further mouse-clicks. The “other appropriate means” could also mean that the information could only be available on an e-mail request and not at all be contained on the product description web pages. Therefore, the regulation contains a discrepancy between recital and legislative formulation, which hopefully will be improved in future amendments of the regulation. We think that transparency can only be reached if all the mandatory information is provided in the same field of vision as the brand name or fancy name of the food.

In general, this new EU policy regarding food information appears to be a first and major step forward regarding the establishment of a policy framework regarding the food trade over the internet. When it comes into force on 13 December 2014, it might remedy the current privilege of internet vendors that they must not provide the full food information before the purchase. The regulation also provides a legal foundation as basis for enforcement and control of pure internet vendors. Automated software programs, e.g. as envisioned by the German BVL (Kuhr & Schreiber, 2009), could screen the internet vendor pages for offerings lacking the mandatory food information, which would be a first step in establishing the same level of control on the internet as currently available only for retail trade.

4.2. Sampling and analysis of food products sold over the internet

As the internet is basically a virtual medium, it would make sense for the food control authorities to conduct a virtual control of the internet web pages. This is already possible in a restricted fashion, when the food regulations include provisions regarding advertisements (e.g. as is the case for misleading claims or forbidden health claims). This virtual control would become even more relevant when the food information regulations are extended to web pages (see Section 4.1). However, the control of advertising claims or health claims is sometimes impossible if the actual composition of the product is unknown. In general, our previous research has even shown that it is often not possible to judge about the legal status of a product (i.e. if it is nutritional supplement or medicine) purely from the information provided on the vendor’s web pages (Löbell-Behrends et al., 2011; Löbell-Behrends, Maixner et al., 2008; Löbell-Behrends, Schweizer et al., 2008). A purely virtual control would also disregard the necessary control of other food safety aspects besides labelling (such as testing for chemical or microbiological contamination, or for adulteration). In all these cases, a physical sample would be required to judge about the marketability of the food as well as its compliance to EU food safety requirements. In the conventional food control, the risk oriented sampling and analysis of food products is of the utmost importance and a central instrument in ensuring food safety (Roth, Hartmann, Renner, & Hörtig, 2007). For example, 5.5 samples per 1000 population are sampled annually in Germany (Neuhaus, 2010).

Our demand is therefore to include the internet trade into the risk-oriented sampling schemes, with a control density that is comparable to that of the conventional retail trade (Böse et al., 2011). While this sounds perhaps only like a technicality, it must be noted that the current EU policy and court rulings regarding sampling basically prohibit or at least complicate the sampling of foods from pure Internet vendors. The sampling for official controls performed to ensure the verification of compliance with food law is regulated in Art. 11 of regulation (EC) No 882/2004 (European Parliament & European Council, 2004b).

In Art. 11(6) of regulation (EC) No 882/2004 it is demanded that competent authorities shall ensure that feed and food business operators can obtain sufficient numbers of samples for a supplementary expert opinion. Art. 11(6) of regulation (EC) No 882/2004 therefore implemented the operator’s right to appeal against the decisions taken by the competent authorities as a result of the official controls. This right was implemented into the EU law, following a judgement of the court of justice of the European Communities (European Court, 2003) (for a detailed discussion about the food operator’s right to apply for a supplementary expert opinion, see Baumann, 2010). The problems regarding sampling of internet vendors are multifold:

1. The conventional sampling is only possible if the vendor is based in the inland with a fully stocked warehouse. In general, the current system does not allow a sampling, if the whole chain of sales is conducted in third countries.
2. The vendor has to be localized and the person responsible for bringing the product on the market has to be identified without doubt. Even this step is problematic in some cases, when vendors try to disguise their physical address (e.g. in the case of the gray market with nutritional supplements).
3. If the sampling would be conducted in the form of an order via the internet by the authorities, it must be considered that the sample selection is conducted by the vendor and is therefore susceptible to manipulation.
4. Secondary samples, which may fulfill the food operator’s right to apply for a supplementary expert opinion, cannot be left behind during distance selling (as no direct physical contact occurs). This is a major point as the infringement of the

Table 4

Areas to be considered in establishing a policy framework for food control on the internet.

<table>
<thead>
<tr>
<th>Area</th>
<th>Policy option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information of consumers</td>
<td>Provide the mandatory food information before the purchase is conducted, i.e. directly on the web pages with product description. The mandatory information must be provided in the same field of vision as the brand name or fancy name of the food, easily visible and clearly legible.</td>
</tr>
<tr>
<td>Sampling and analysis</td>
<td>Include the internet trade in the risk-oriented sampling and analysis schemes to allow official controls to ensure compliance with food law (e.g. labelling, advertising claims, testing for food safety or adulteration). The governmental food safety authorities should be allowed to conduct sampling by online order (anonymous if required). Special regulations considering the food operator’s right to apply for a supplementary expert opinion are necessary.</td>
</tr>
<tr>
<td>Protection of consumers in respect to distance contracts for the supply of foods</td>
<td>Include perishable foods into the consumer’s right of withdrawal from contracts. Make the supplier liable for the food safety during transport (e.g. if the cooling chain is broken). The burden of proof should be on the supplier not on the consumer.</td>
</tr>
<tr>
<td>Protection of young people</td>
<td>The youth protection laws should be adapted to internet marketing and distance selling</td>
</tr>
</tbody>
</table>

* The mandatory food information should at least comprise the name of the food, the list of ingredients including ingredients or processing aids causing allergies, the quantity of certain ingredients, the net quantity of the food, any special storage conditions and/or conditions of use, the name and address of the food business operator, the alcoholic strength (for beverages containing more than 1.25% vol), a nutrition declaration, as well as some other elements for specific foods.
adversarial principle, and thus, of the right of a fair hearing, may risk the admissibility of the evidence of the results of the analyses of such a sampling (see, e.g. European Court, 2003).

All these points lead to the fact that currently no sampling at all is conducted on the internet in Germany (i.e. from the 5.5 samples per 1000 people per year, none is coming from online orders) and we found no information that systematic sampling on the internet is conducted in any other European member state. Besides the labelling issue, the sampling issue is the second area where the food authorities cannot act, as legislation is urgently required. This could perhaps be in the form of an amendment of regulation (EC) No 882/2004 (European Parliament & European Council, 2004b), which should include the possibility of sampling by an online order conducted by a governmental agency, which also needs to be done anonymously in cases of reasonable suspicion. Secondary samples, which may fulfill the food operator’s right to apply for a supplementary expert opinion, could be sent to the operator on the same way. Alternatively, distance selling could be included in the list of exceptions for which no samples for a supplementary expert opinion need to be provided.

5. Conclusion

The lack of control of the internet market appears not to be due to a lack of enforcement or an inactivity of the food control authorities, but by a general lack of legislation aligned to the specific necessities and features of the internet market. As we have pointed out above, the food authorities cannot act, as legislation is either inadequate (food information) or not applicable (sampling and analysis). The identified problems with sometimes grave consequences for the health of consumers lead to the need for an EU policy framework. There are a number of potential policy options outlined by this review. The major options are summarized in Table 4. However, it must be stressed that many options identified thus far in the literature are based on empirical and observational evidence. No policy research (e.g. for cost-effectiveness) about food policy regarding internet trade was identified. Work in this area is new and developing – we believe that the review here provides a foundation for future thinking and research about potential policy options, and not a concrete, well-developed manual for direct implementation.

Conflicts of interest

None declared.

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References
