Methodology for analyzing EU-conform label information content of meat products in Romania

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A B S T R A C T

This paper presents a proposal for the methodology to investigate the information content of meat product labels, which are found on the Romanian market. The analysis was performed taking into account information requirements of the European Legislation to the rules of 432/2012, 1169/2011, 1333/2008, 1924/2006. 193 for meat products. They were analyzed and results show that only 20% of them fulfill the requirements.

1. Introduction

Food labels are designed to help people in choosing foods for a healthful diet. By using the food label, we can compare the nutrient content of similar foods, can see how foods fit into our overall diets, and can understand the relationship between certain nutrients and diseases.

Health professionals agree upon the importance of the relationship between diet and health. Our eating habits can help or hurt our overall health and well-being. Good eating habits include being smart shoppers, selecting foods that reflect the Dietary Guidelines.

The project FP7-PEOPLE-2012-IRSES 318946 - NUTRILAB is a multidisciplinary and comparative Joint Exchange Programmed with the mission to identify and examine how nutritional labeling in European countries and out of Europe fulfills the actual legislation requirement. Starting in January 2013, with duration of 36 months, this project has the following aims:

- Bring together, review and analyze current research on consumer understanding of claims, and also labeling, where this would inform our knowledge of consumer understanding of claims;

- Gather information on how consumer understanding of claims varies across different population groups, to gain insight into the understanding of the 'average consumer';

- Draw conclusions from existing research to see whether there are areas where further information would be useful, and to inform the direction that any additional research conducted in future could take.

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2. Study on Nutritional Labelling European Legislation

Fulfilling the nutritional labelling criterions related to European regulation no 432/2012, 1169/2011, 1333/2008, 1924/2006, it is a difficult task, studied by numerous researchers from different locations in the European Union.

The project no. 318946 FP7 IRSES - NUTRILAB (NUTritional LABeling Study in Black Sea Region Countries) is looking forward to the accomplishment of the mentioned criterions in the countries around the Black Sea. In this direction, those regulations were fully studied and identified.

Regulation 1924/2006 contains information on nutrition and health claims, made on foods and, harmonizes the provisions laid down by law, regulation or administrative action in Member States. This relates to nutrition and health claims in order to ensure the effective functioning of the internal market, whilst providing a high level of consumer protection.

This Regulation is referring to nutrition and health claims made in commercial communications, whether it is in the labeling, presentation or advertising of foods to be delivered to the final consumer.

Regulation 1333/2008 harmonizes the use of food additives in foods in the Community. This includes the use of food additives in foods covered by Council Directive 89/398/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to foodstuffs intended for particular nutritional uses and the use of certain food colors for the health marking of meat and the decoration and stamping of eggs. It also harmonizes the use of food additives in food additives and food enzymes thus ensuring their safety and quality and facilitating their storage and use.

Regulation 1169/2011 contains information on the provision of food information to consumers, as follows:

Mandatory food information: Content and presentation, Weights and measures, Availability and placement of mandatory food information, Presentation of mandatory particulars, Language requirements, Name of the food, List of ingredients, Labelling of certain substances or products causing allergies or intolerances, Quantitative indication of ingredients, Net quantity, Minimum durability date, 'Use by' date and date of freezing, Storage conditions or conditions of use, Country of origin or place of provenance, Instructions for use;

Voluntary food information: Information on the possible and unintentional presence in food of substances or products causing allergies or intolerances, Information related to suitability of a food for vegetarians or vegans; Indication of reference intakes for specific population groups.

Also, at the end of this regulation there are specific mentions for different types of products, like: „meat products, meat preparations and fishery products which may give the impression that they are made of a whole piece of meat or fish, but actually consist of different pieces combined together by other ingredients, including food additives and food enzymes or by other means, shall bear the following indication:

in Bulgarian: 'формовано месо' and 'формована риба';

in Spanish: 'combinado de piezas de carne' and 'combinado de piezas de pescado';

in Czech: 'ze spojovaných kousků masa' and 'ze spojovaných kousků rybího masa';

in Danish: 'Sammensat af stykker af kød' and 'Sammensat af stykker af fisk';

in German: 'aus Fleischstücken zusammengefügt' and 'aus Fischstücken zusammengefügt';..." and so on for all official European languages.

Regulation 432/2012 from 16 May, 2012 is referring to the establishing a list of permitted health claims made on foods, other than those referring to the reduction of disease risk and to children's development and health.

The indications are set in a 30 pages tables with specific components, like:

"Linoleic acid

Linoleic acid contributes to the maintenance of normal blood cholesterol levels. The claim may be used only for a food which provides at least 1,5 g of linoleic acid (LA) per 100 g and per 100 kcal. Information shall be given to the consumer that the beneficial effect is obtained with a daily intake of 10 g of LA", or:

"Magnesium

Magnesium contributes to normal protein synthesis. The claim may be used only for food which is at least a source of magnesium as referred to in the claim SOURCE OF [NAME OF VITAMIN/S] AND/OR [NAME OF MINERAL/S] as listed in the Annex to Regulation (EC) No 1924/2006".

3. Data collection

After analyzing regulations, a number of information categories were identified that have a very clear specification and can be statistically analyzed. These types of information are:

- the name of the food product, the list of ingredients,

- substances or products causing allergies or intolerances,

- the quantity of certain ingredients or categories of ingredients,

- the net quantity of the food, (g, ml, kg),

- the date of minimum durability or the 'use by' date,

- any special storage conditions and/or conditions of use,

- the name or business name and address of the food business operator, the country of origin or place of provenance,

- instructions for use where it would be difficult to make appropriate use of the food in the absence of such instruction,

- language, font size, the energy value, per portion or %, kcal and kJ,

- fat, protein, carbohydrates, saturates, sugars, salt, polios, starch, fibers,

- MUFA, PUFA, vitamins, minerals, conclusions, recommendations, notes.

Fig. 1 shows an Excel sheet for meat products according to the presented methodology. For a unified approach to the study in all involved countries with the chosen working methodology provides additional identification for each product label for a specific code resulted a set of 28 information categories.

These can be studied statistically in the Excel application in various ways, by considering the most important criteria.

In the example of meat, the products have been divided into seven main categories: sausages, processed meat, meat specialties, frankfurters, liver pates, baloney and salami.

Figure 1 Data collection for meat products

There were used a total of 193 meat products, whose label were photographed in some supermarkets in the town of Brasov, in January 2013. Manufacturer's name will be removed from the table for reasons of confidentiality.

The fields corresponding to each category of information were provided for each product, with the following type of content:

- Product name: text information;
- List of ingredients: text information;
- Net quantity, the date of minimum durability…..: binary character 1 or 0 depending on the presence or absence of information on the label;
- Substances that cause allergies or intolerances….: binary character Y or N, depending on the compliance or non-compliance.

If in the list of ingredients there is present an allergen, but it is not marked with a particular font, is not distinguished by a different colour, as well as there is no separate mention of allergen content, the 5th field of the table is filled with "N" and the allergen is highlighted in red.

Likewise, the criterion amount of ingredients should note that it is mandatory when food ingredient appears in the name/title, being usually associated with that name by the consumer, therefore it should be accentuated on the label in words, or it is essential to characterize the product and distinguish from others with which it might be confused because of its name or appearance.

This analysis can be done within a product category or subcategory of products (within the same worksheet in Excel) or for all products in a given category (meat), in the particular worksheet named "analysis".

4. Analysis and interpretation of data

Interpretation of data in the table was made using "COUNTIF" for counting the symbols Y, N, 1 or 0, in columns 5 .... 29. The criteria on which the presence or absence of information reflect specific compliance or non-compliance from the Regulation, were filled up with 1 or 0.

In cases, where the information corresponding to a criterion should be interpreted to assess the situation correctly fulfilled or unfulfilled, we used symbols Y or N, respectively. For example, in the case of allergens, there are situations such as:

- There are allergens (soy, mustard, lactose, etc) and these are indicated by a special mention (Y);
- There are allergens (soy, mustard, lactose, etc) and they are marked with special fonts (Y);
- There are allergens (soy, mustard, lactose, etc.) but only some of them are marked by special mention, or special font (N);
- There are allergens (soy, mustard, lactose, etc.), but they are not mentioned by a warning text and no special font either (N);
- There are no allergens and they are not mentioned (Y).

Similarly, the criterion amount of ingredients should note that it is mandatory when food ingredient appears in the name/title, being usually associated with that name by the consumer, therefore it should be emphasized on the label in words, or it is essential to characterize the product and differentiate from others with which it might be confused because of its name or appearance.

This analysis can be done within a product category or subcategory of products (within the same worksheet in Excel) or for all products in a given category (meat), in the particular worksheet named "analysis". This way allows evaluating the compliance of a particular criterion for a particular class of products. A particular interest is the determination of the percentage of products that simultaneously fulfils all eligibility criteria imposed by European legislation at the moment. For this, counting is done by symbols Y or 1 for specific mandatory information criteria fields tracked simultaneously. Query result horizontally for each product type is 1 or 0, meaning total or partial compliance of the applicable requirements.

By summing up vertically the results of evaluations conducted horizontally, it will obtain the number of products that fully comply with the mandatory labelling requirements. By reporting the total number of products, **determine the percentage of products that fulfill simultaneously all the criteria for labelling.**
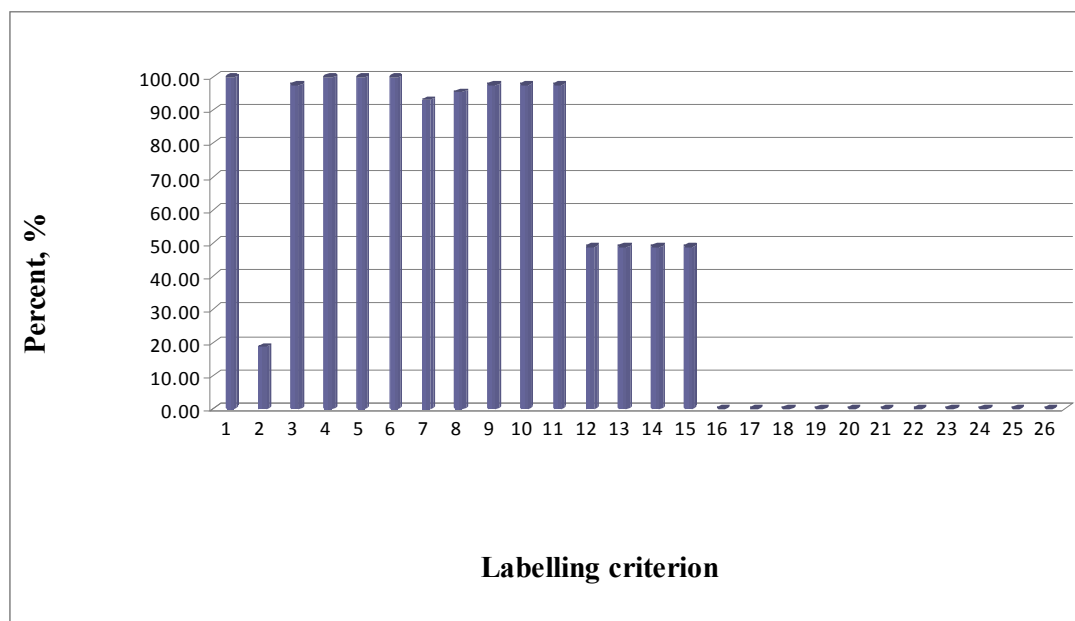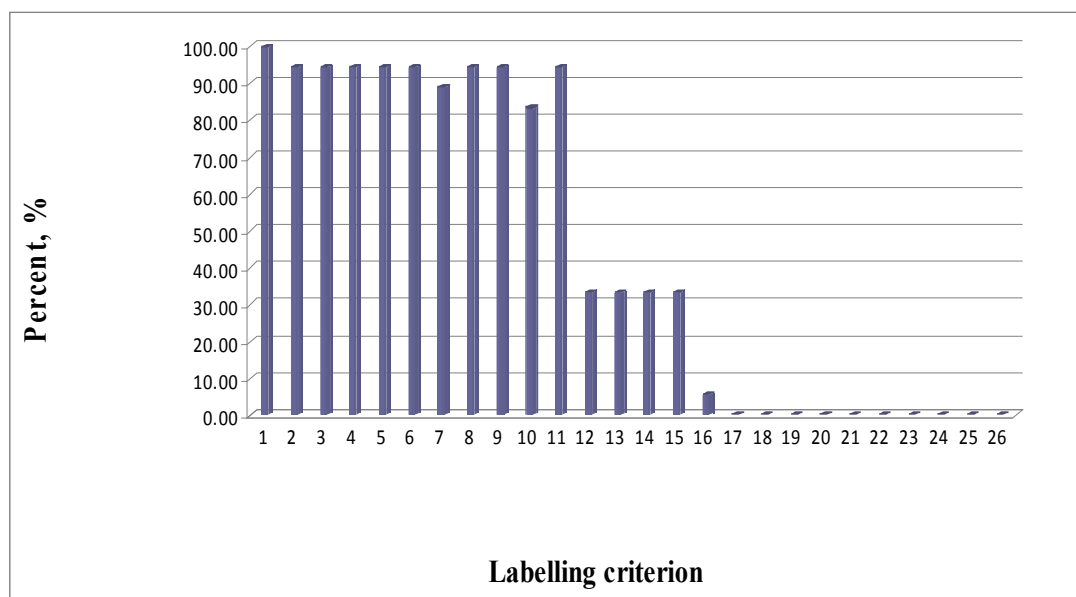

a.
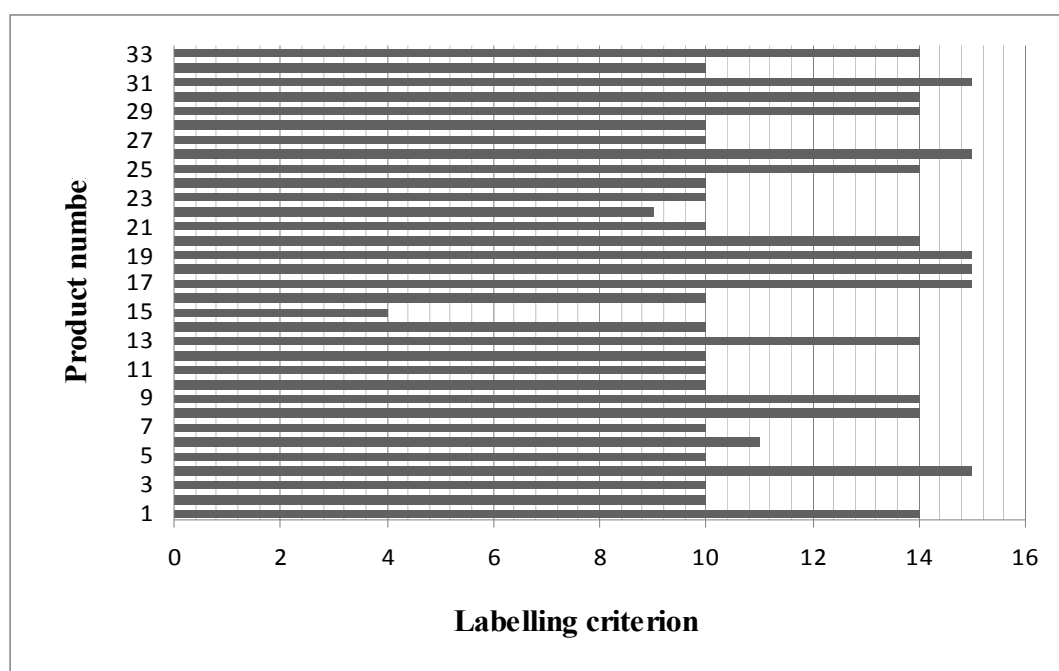
b.

Figure 2 Evaluation results for sausages (a-percentage, depending on labeling criterion;
b- product number depending on labeling criterion)

Fig. 2 presents the evaluation results for sausages (a-percentage depending on labelling criterion-how many products fulfill the requirement of a specific criterion; b- product number depending on labelling criterion – how many requirements are fulfilled by a specific product. It can be observed that most of the products fulfills the criteria # 3…11. Just 18% of products respect to the # 2 criterion (allergens) and no products fulfill the requirements of # 16…26 criteria.
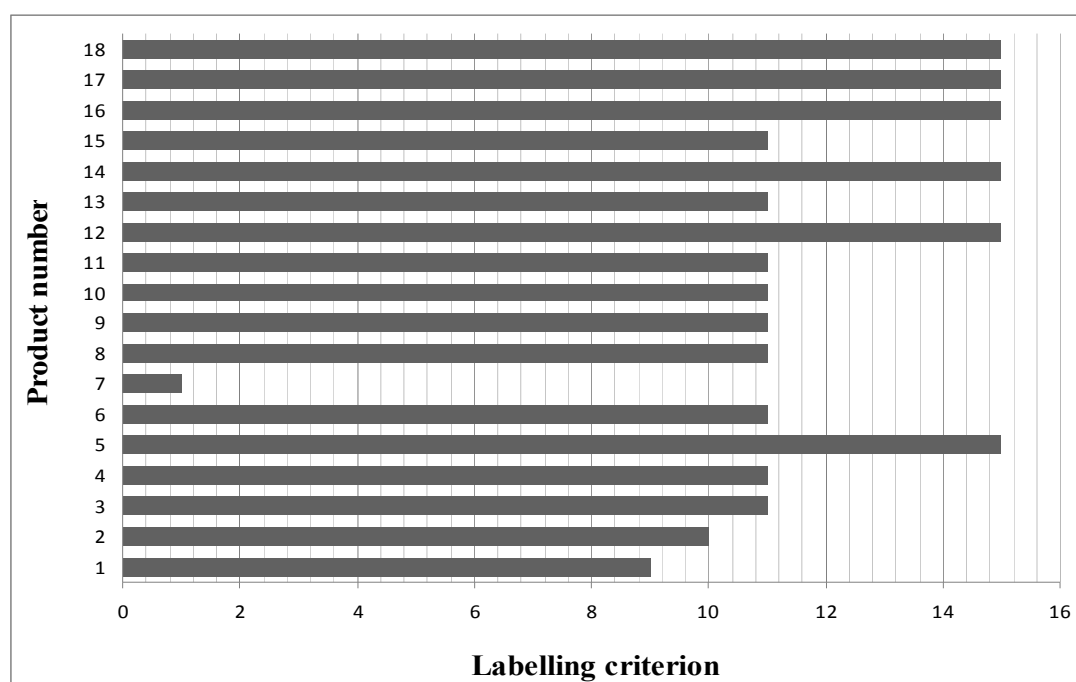
a.

Figure 3. Evaluation results for meat specialties (a-percentage, depending on labelling criterion; b- product number depending on labelling criterion)

In the same manner, Fig. 3 presents the evaluation results for meat specialties (a-percentage depending on labelling criterion- how many products fulfill the requirement of a specific criterion; b-product number depending on labelling criterion – how many requirements are fulfilled by a specific product. Most of the products fulfills the criteria # 3…11 and 6 products fulfill 15 criteria. Just 30% of products respects to criteria # 12, 13, 14, 15 and no products fulfill the requirements of # 16…26 criteria.

The same analysis was performed for the next meat product categories: processed meat, frankfurters, baloney, salami, and liver pates.
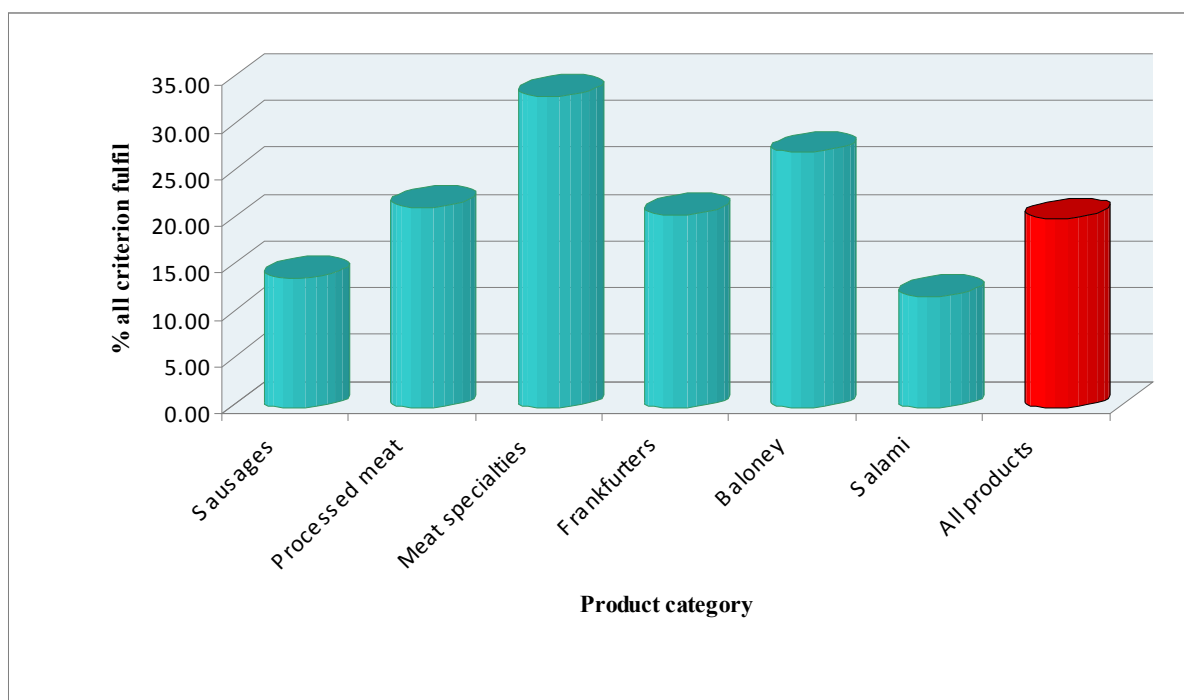
Figure 4 Simultaneous compliance rank of all criteria for each category of product

Fig. 4 shows the case of simultaneous compliance rank of all criteria for each category of by product. It can be noticed that the highest percentage is obtained by meat specialties and, the lowest by salami. The medium values for all meat product is 20.21% that fulfils all criterion requirements. Since there are just 2 liver pates products, these were not taken into account.

5. Conclusions

Nutritional labeling of food in the European Union is very strictly regulated by a number of important regulations, such as: 432/2012, 1169/2011, 1333/2008, 1924/2006. Simultaneous indication of the rank of compliance with all the provisions of these Regulations in a case of a specific product is a challenge for statistical analysis, due to numerous general provisions, exceptions, or particular cases related to the product or region. The proposed methodology aims to complement **information of 28 fields with information** type like text or binary characters 0, or 1, as applicable, and extracting useful information queries performed on rows and columns, using the "COUNTIF". Thereby it is possible to determine the rank of compliance with a particular criterion or the percentage of products that fulfills all of the criteria simultaneously. The proposed method has the advantage of flexibility in interpreting the data, because queries can be made for any number of specific criteria, thus it allows analysis by taking into account the recommendations of potential binding in the future.

Acknowledgement

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