Quality research of (seemingly) identical products on the markets of old and new EU member states

- FINAL REPORT -

Osijek, August 2017

ACKNOWLEDGMENTS

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1. INTRODUCTION

When the Republic of Croatia accessed the European Union (EU), it became a member of the unique market where all EU citizens are entitled to products of equal quality, under equal conditions. Marketing products of different quality under the same trade name raises an issue of respecting fundamental values of the European Union. However, the results of the product quality research in various EU member states, performed in the Check Republic in 2015, supports the abovesaid thesis that the quality of the same products is not the same in the markets of the old and new EU member states. Namely, from the total of 23 samples of the same food products taken from the Check and the German markets, it was determined that 34.8 % thereof differed, taking into consideration parameters of physical and chemical analysis, sensory analysis, labels and prices.

Pursuant to the results of the research, the Check Republic started the initiative which was joint by Slovakia, Bulgaria, Estonia and Croatia, and later on also by Hungary, Greece and Slovenia, and they sent a joint letter addressed to the European Commission (EC) and the European Parliament, in which they addressed EC and draw attention to operation of multinational companies that offer the same products of different quality and content in different member states, depending on the market they are intended for. They request in the said letter that EC should research this problem, and that the said topic should be discusses at the meeting of the *High Level Forum for a Better Functioning Food Supply Chain* with the goal of finding legislative measures which will prevent the existing unfair practices.

Croatian Food Agency (CFA), at the initiative of Biljana Borzan, MD, a member of the European Parliament, joined the quality research of (seemingly) identical products in markets of old and new EU member states. The goal of this research is to test physical and chemical properties, sensory properties and compare labels* of the products on the Croatian market, as the latest EU member state, compared to the (seemingly) identical products on the German market, as an old EU member state. The research was fully financed by S & D group of the European Parliament, and due to the complexity of the same, the research was performed in several phases.

*Comparison of labels refers to harmonisation with regulations (Regulation (EU) No. 1169/2011 of THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2011 on Food Consumer Information) and/or consistency between the two markets.

2. RESARCH PHASES

2.1. The first research phase - defining the list of products and parameters for quality analysis

Within the first phase of the research, a list of products was defined. It included 23 food products and 5 products from the category of cleaning agents and personal hygiene products.

No.	GROUPS OF PRODUCTS	BRAND NAME
1.	*beverages*	JACOBS CRONAT GOLD INSTANT COFFEE
2.		PEPSI COLA
3.		COCA COLA
4.		COCA COLA ZERO
5.		BRAVO 100 % ORANGE JUICE
6.		NESTEA ICE TEA PEACH
7.		HEINEKEN BEER
8.		RED BULL ENERY DRINK
9.	*confectionery products*	MILKA CHOCOLATE WITH WHOLE HAZELNUTS
10.		NUTELLA
11.		HARIBO GUMMY CANDY
12.	*dairy products*	PHILADELPHIA SPREADABLE CREAM CHEESE
13.		ACTIVIA STRAWBERRY FRUIT YOGHURT
14.		MONTE MILK DESSERT
15.	*fish products*	RIO MARE TUNA IN OLIVE OIL
16.		IGLO FISH FINGERS
17.	*oils and fats*	MONINI OLIVE OIL
18.		RAMA SPREAD
19.	*pasta*	BARILLA SPAGHETTI
20.	*snacks*	PRINGLES POTATO CRISPS ORIGINAL
21.	*meat products*	WUDY FRANKFURTERS
22.	*baby food*	HIPP RICE AND CARROT WITH TURKEY
23.	*cereal products*	NESQUIK CEREAL
24.	*cleaning agents and personal hygiene products*	ARIEL DETERGENT POWDER
25.		SILAN FABRIC SOFTENER
26.		DOMESTOS UNIVERSAL CLEANING AGENT
27.	*personal hygiene products*	NIVEA SHOWER GEL
28.		COLGATE TOOTHPASTE

The list was obtained based on the results of telephone research on a representative sample of Croatian population (GfK, June 2016, N=800), National research on eating habits of Croatian adult population (NIPNOP), HAH 2011-2012, and using the data on the most commonly consumed foreign brands in the Republic of Croatia for individual product categories.

The product selection plan was conceived in such a manner to analyse the same kind of product of the same manufacturer marketed on the German and the Croatian market pursuant to identical parameters, in order to determine if there is a difference between those marketed on the German market and those on the Croatian market. In the first phase of the research, quality parameters were defined as well, specific for individual product, analysed during the third research phase.

2.2. The second research phase – selecting the laboratory and taking product samples

In this research phase, accredited laboratories were selected pursuant to standard HRN EN ISO 17025:2007 for performing analyses, and products from Croatian and German markets were sampled.

Since the research included various product categories, and taking into consideration their competence and type of accredited methods, the following laboratories were selected for physical and chemical analyses:

- *Food Control Centre at the Faculty of Food Technology and Biotechnology in Zagreb*, Jagićeva 31, Zagreb
- *Andrija Stampar Teaching Institute of Public Health,* Mirogojska 16, Zagreb
- *Euroinspekt Croatiakontrola d.o.o*., Karlovačka cesta 41, Zagreb
- *Croatian Institute of Public Health,* Rockefellerova 7, Zagreb.

Physical and chemical analyses of the products included checking the nutritive label and net amount of the product, as well as measuring the quality parameters defined in advance, which were product-specific.

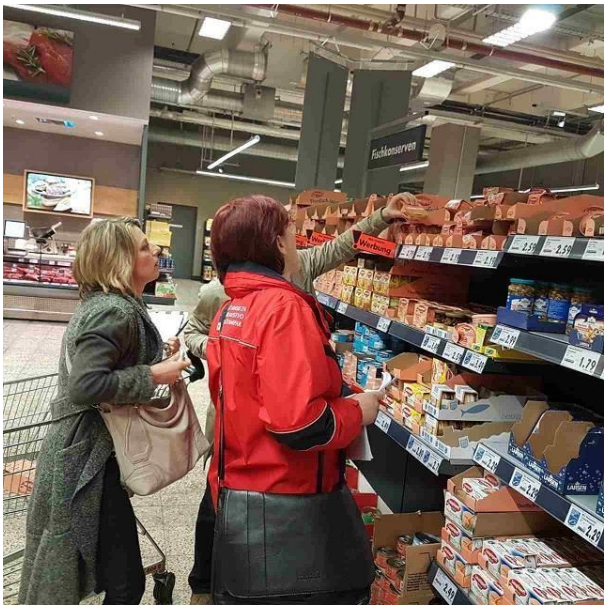
The following laboratory was selected for sensory analyses:

- *Laboratory for Food Quality Control, Department of Food Quality Control, Faculty of Food Technology and Biotechnology of the University of Zagreb*, Pierottijeva 6, Zagreb.

Sensory analyses included sensory quality testing by using three tests, namely: evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points,

determining overall difference between the identical samples from Croatian and German markets by using the triangle test (ISO 4120:2004), and determining sensory parameters and their intensity by which said samples differ from each another, by means of the paired comparison test (ISO 5495:2005). For the significance of differences, the value $p \leq 0.05$ was used for all three tests. All sensory analyses were performed by a group of 11 to 15 sensory analysts concerning evaluation of the total sensory quality by using the scoring system, i.e. 23 to 30 sensory analysts when triangle tests and paired comparison tests were used. All sensory analysts are employed by the Faculty of Food Technology and Biotechnology of the University of Zagreb, and they have the knowledge and abilities to perform sensory evaluation of food products. Half of the analysts (50 %) who participated in triangle tests and paired comparison tests were aged 35 to 55 (other 50 % were younger than 35), 93 % thereof were women, and 60 % (of the total number of analysts) had a PhD degree. For evaluation of the overall sensory quality, experts were included, competent for specific type of products, and they belong to the previous three groups according to their sex, age and professional qualifications.

All products were sampled in the period from 29 to 31 March 2017 in Germany (Munich) in stores Rewe, Edeka and Kaufland, and in Croatia (Zagreb) from 3 to 5 April 2017 in Kaufland, Konzum, Plodine, Interspar and Billa. Samples were taken by experts from Andrija Stampar Teaching Institute of Public Health, and a representative of the Croatian Food Agency, as the institution that played the role of an expert coordinator for the entire research, taking care that the research is conceived and implemented on scientific basis. For that very purpose, care was taken during sampling that all packaging of the identical products were **from the same lot and expiration, that they were transported to the laboratories in a suitable manner, and kept in compliance with the instruction on storage specified on the label of each product.**


Fischkonserven
Werbung

During sampling, it was discovered that there were no fish sticks of the same manufacturer, therefore, instead of the planned 28 products, 27 were sampled (22 food products and 5 products from the category of cleaning agents and personal hygiene products).

Moreover, there is no identical Rama spread on German and Croatian markets there, i.e. the spread with the same share of fat. Namely, at the moment of taking samples from the German market, Rama fatty spread with 70 % fat was found in all visited stores, while there were two types of Rama spread on the Croatian market: three-quarter fat margarine with 60% fat, and fatty spread with 48 % fat. As such, they belong to a different category of products*, which makes them impossible to compare (more details - 3.4.).

*****_REGULATION (EU) No. 1308/2013 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No. 922/72, (EEC) No. 234/79, (EC) No. 1037/2001 and (EC) No. 1234/2007._

Since there were no Silan fabric softener and Domestos cleaning agent on the German market, Lenor fabric softener and Bref cleaning agent were sampled instead, as those products were the next ones on the list made by consumers in the questionnaire. Bravo 100% orange juice was not found on the Croatian market as well, therefore, another 100% orange juice was sampled from the same manufacturer (Happy Day).

2.3. The third research phase – product analysis and results processing

In the third research phase, the products were analysed, and the results of the physical and chemical analyses of the products on both markets were processed and compared, as well as the information found on the labels and the prices thereof.

With the goal of scientific and professional approach to processing and comparing the research results, Croatian Food agency formed a Working group consisting of:

1. prof. Nada Vahčić, PhD, *Faculty of Food Technology and Biotechnology of the University of Zagreb* – president of the working group
2. Milica Gačić, PhD *Food Control Centre at the Faculty of Food Technology and Biotechnology of the University of Zagreb* – vice-president of the working group
3. prof. Jasna Bošnir, PhD, *Andrija Stampar Teaching Institute of Public Health*, Zagreb
4. Vlasta Brlek, MSc, *Euroinspekt Croatiakontrola d.o.o*., Zagreb
5. Ivona Vidić Štrac, MSc, *Croatian Institute of Public Health*, Zagreb

Representatives of Croatian Food Agency in the Working Group were:

1. Andrea Gross-Bošković, head of the Agency
2. Jasenka Petrić, MSc, Working Group coordinator

For the purpose of interpreting the results, the products were divided into those with significant difference in quality, into those with small difference in quality, and the products where the difference in quality was not determined.

Significant difference in quality means the difference in two or three criteria (physical and chemical analysis, sensory analysis, and label compliance), while small difference in quality refers only to difference by one criterion.

The results of analytical reports of physical and chemical analysis, sensory analysis/organoleptic evaluation, and comparison of labels refer to the analysed samples delivered of the analysis of the accurately specified date and under the specified code.

3. ANALYSES RESULTS

3.1. Products where difference in quality is significant

Of all analysed products, large (statistically significant, $p < 0.05$) difference in quality was determined in 6 products, specifically in two or three of the observed criteria (physical and chemical analysis, sensory analysis/organoleptic evaluation and label compliance). Five products thereof are from the category of food products, and one from the category of cleaning agents and personal hygiene products.

3.1. 1. WUDY, CHICKEN-AND-TURKEY FRANKFURTER WITHOUT FOIL

Manufacturer: *Agricola Italiana Alimentare* (AIA)

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- gluten

collagen

meat proteins

polyphosphates

nitrites

total phosphorus

soy proteins

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested quantities and declared quantities of nutrients are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012). However, the products purchased on the German and Croatian markets differ significantly by components (basic raw material and additives).

The information listed on the product label from the German market state that the product was made of 62 % turkey meat and chicken fat, unlike the product from the Croatian market, which was produced from mechanically deboned turkey and chicken meat (94 %), which, according to EU legislation, is not included into the definition of "meat" (Regulation (EU) No. 853/2004 of the European Parliament and of the Council as of 29 April 2004, laying down specific hygiene rules for food of animal origin.)

The manner of marking the product from the Croatian market (100 % carni italiane, in translation 100 % Italian meat) and the name of the product ("Frankfurters made of chicken and turkey meat") mislead the consumers concerning the composition and components of the product, since mechanically deboned turkey and chicken meat must not be labelled as "meat" according to EU legislation.

The product on the Croatian market contains added polyphosphates (E450, E452) unlike the product from the German market, where the polyphosphates were not added.

Sensory analysis determined differences in colour, taste and texture (the product form the German market is lighter, fattier and softer).

3.1. 2. HIPP BABY FOOD - BIO RICE AND CARROT WITH TURKEY

Manufacturer: *Hipp*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

α-linolenic acid (omega-3)

dry matter

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

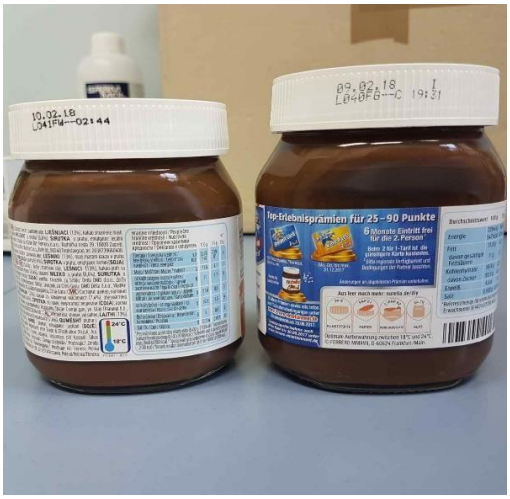
there is no difference

Conclusion:

The components listed on the list of ingredients are not the same for both markets (concerning vegetables, the product from the German market contains carrots and potatoes, while the product from the Croatian market contains only carrots). Moreover, the ratios of the ingredients used are not the same for the German and the Croatian markets, although both products are marketed under the same item code for both markets. The product from the German market contains more vegetables (38 %, carrots and potatoes) and less rice (15 %), unlike the product from the Croatian market which contains 24% carrots and has greater share of rice (21 %). The abovesaid supports the claims that the same list of ingredients is not applied on both markets, which is confirmed by the results of sensory analyses, where a difference in colour, taste and aroma was noticed. Moreover, the products differ in the amount of rapeseed oil (source of omega-3 fatty acids), which the product from the German market contains 1.9 %, and the product form the Croatian market 1.7 %. The spotted differences are especially significant since it is baby food.

3.1. 3. NUTELLA, HAZELNUT AND CACAO CREAM PRODUCT

Manufacturer: *Ferrero*



Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- fatty acids profile
- trans-fatty acids
- determining type and profile of sugar
- moisture
- ash
- rheological properties / viscosity

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference
there is no difference

Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

By comparing the labels, a difference in the list of ingredients was noticed. The product from Croatia contains whey powder and a small percentage of skimmed milk powder (6.6%), while the product from Germany contains only skimmed milk powder (7.5%). Both products specify that they contain 13 % hazelnuts.

There is a significant difference in spreadability of the product, which is confirmed by the results of physical and chemical analyses (the product bought in Croatia has higher pour point which means it is more difficult to spread it at the same temperature).

There is also a significant difference in colour, smell and taste of the product (the product bought in Croatia is sweeter, denser and has more of a cocoa taste, while the product from Germany is darker, has a hazelnut taste and spreads more easily).

3.1.4. DANONE ACTIVIA BIFIDUS ACTIREGULARIS® STRAWBERRY FRUIT YOGHURT

Manufacturer: *Danone*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

synthetic colours

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

There is a significant difference in the list of ingredients: the product bought in Germany does not contain the said additives, and has somewhat greater share of strawberries, while the product bought in Croatia has acidity regulator (sodium cyclamate and citric acid) and thickener (carrageenan) listed on the label.

Sensory analyses determined that there is a difference in taste – the product bought in Croatia is characterised as "sweeter".

The greater share of sugar was also confirmed by the chemical analysis.

Individual package (cup) for the Croatian market has mandatory information for the consumers listed in the Hungarian language, which is not in compliance with the Regulation (EU) 1169/2011.

3.1. 5. HARIBO HAPPY COLA, COLA FLAVOURED GUMMY CANDY

Manufacturer: *Haribo*

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- determining type and profile of sugar
- moisture
- ash

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The physical and chemical analysis determined a significant difference in the amount of total sugar between the products from the German market and from the Croatian market. The product bought in Germany has significantly greater amount of total sugar than the amount listed on the label, which is not in compliance with the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

The said difference was determined during the sensory analyses as well, where the respondents characterised the candy intended for the German market as sweeter.

3.1. 6. ARIEL LAUNDRY DETERGENT POWDER

Manufacturer: *Procter&Gamble*

Analyses were made in cooperation of *Department for General Use Items, Division for Environmental Health, of the Croatian Institute of Public Health in Zagreb* and *Faculty of Textile Technology University of Zagreb*.

Physical and chemical analyses:

total surfactants

active matter anion surfactants

active matter non-ionic surfactant

chlorides

carbonate minerals

mineral residue + silicates

proteolytic activity

efficiency of washing pursuant to the manufacturer's instruction (at the same temperature and water hardness) at 40ºC and 60ºC

organoleptics

Results:

PHYSICAL AND CHEMICAL ANALYSES	ORGANOLEPTICS	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

By comparing the products from German and Croatian markets, a significant difference regarding organoleptics, composition, volume ratio of the packaging, type of packaging, dosing, formulation ("compact") is visible and, as a result, the testing parameters of the content of active substances, inorganic compounds and enzymatic activity are significant as well.

The product from the German market is significantly more efficient in washing at low temperatures (40ºC), which is in compliance with the results of measuring proteolytic activity. The difference in washing efficiency is also present at 60ºC, but the differences of the detergent efficiency at higher temperatures are smaller than at 40ºC. Namely, for the same washing effect of the "compact" formulation, less powder is needed at low temperatures, unlike doing the laundry with the detergent with surface active agents only, which has to be used at higher temperatures.

ARIEL products with "compact" formulation are not available on the Croatian market, except in one chain of stores, which has a reputation of selling the products intended for the western market.

3.2. Products where difference in quality is small

In 8 products (all within the category of food products), small difference in quality was found.

- In 3 products, there is a difference in the composition of the products intended for the Croatian and for the German markets, despite the fact that from the labelling point of view, i.e. compliance with the regulation on consumer information, their labels are correct,
- no difference in quality was found in 3 products from the German and from the Croatian markets, but they are not in compliance with the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on Food Consumer Information,
- 2 products differ in sensory properties.

All of the said products are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

3.2. 1. COCA COLA, CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE

Manufacturer: *Coca Cola Company*

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- sodium
- sorbic acid
- benzoic acid
- caffeine
- acesulfame – K
- aspartame
- saccharin
- cyclamate
- types of sugar (fructose, glucose, sucrose)
- phosphorous acid
- CO_2 contents

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

The products differ according to type of sugar they contain. The label of the product from the German market states that it contains sucrose, and the product from the Croatian market has sucrose replaced by high-fructose corn syrup. From the aspect of labelling, i.e. compliance with the regulations on consumer information (Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information) this product was labelled correctly, however, there is a difference in ingredients in the product intended for German and Croatian markets.

3.2. 2. NESTEA ICE TEA PEACH, NON-CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE WITH TEA EXTRACT AND THE TASTE OF PEACH

Manufacturer: *Coca Cola Company*

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- natrium
- sorbic acid
- benzoic acid
- caffeine
- theophylline
- theobromine
- acesulfame – K
- aspartame
- saccharin
- cyclamate
- types of sugar (fructose, glucose, sucrose)

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested amounts and the amounts of nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

The products differ according to ingredients listed on the label. The product from the Croatian market contains fructose and sweeteners (steviol glycoside), and the product from the German market contains sucrose, therefore, the energy value of the product from Croatia is lower than the product from Germany. From the aspect of labelling, i.e. compliance with the regulations on consumer information (Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information) this product was labelled correctly, however, there is a difference in ingredients in the product intended for German and Croatian markets.

3.2. 3. MILKA. MILK CHOCOLATE WITH ALPINE MILK AND WHOLE HAZELNUTS

Manufacturer: *Mondelez*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

share of hazelnuts

milk fat

fatty acids profile

total share of cocoa

fat-free dry matter of cocoa share

fibres

humidity

ash

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

*The products differ according to the ingredients listed on the label. The product on the Croatian market contains two emulsifying agents (soya lecithin and E476**), while the product from the German market contains only one emulsifying agent (soya lecithin).*

From the aspect of labelling, i.e. compliance with the regulations on consumer information (Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information) this product was labelled correctly, however, there is a difference in ingredients in the product intended for German and Croatian markets.

**polyglycerol polyricinoleate – used in chocolate production as replacement for cocoa butter (Chemical Engineering, Volume 2013 (2013), Article ID 124767, 21 page)

3.2. 4. EXTRA-VIRGIN OLIVE OIL CLASSICO

Manufacturer: *Monini*

Analyses were performed in cooperation with *Food Control Centre at the Faculty of Food Technology and Biotechnology of the University of Zagreb– Food Technology and Biotechnology Laboratory of the Institute of Agriculture and Tourism, Poreč*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

peroxide value

UV spectrum constants (K232, K270, Delta-K)

stigmastadiene

determining composition and share of sterol and triterpene alcohol

Sensory analysis:

Method by International Olive Council for evaluation of virgin olive oils (COMMISSION REGULATION (EEC) No. 2568/91 as of 11 July 1991 on the characteristics of olive oil and olive-residue oil and on the relevant methods of analysis.)

ANNEX 12

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

The olive oil from the Croatian market has no nutritive declaration listed and is not in compliance with the Regulation (EU) 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on Food Consumer Information, however, no difference in physical and chemical quality properties, and sensory quality properties was noticed between the products intended for German and for Croatian markets.

3. 2.5. NESQUIK, BREAKFAST CEREAL WITH THE TASTE OF CHOCOLATE, WITH ADDED VITAMINS AND MINERALS

Manufacturer: *Nestle*

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- calcium
- iron
- vitamin D3
- vitamin B complex (B1, B2, B3, B5, B6, B9)
- fibres
- water

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

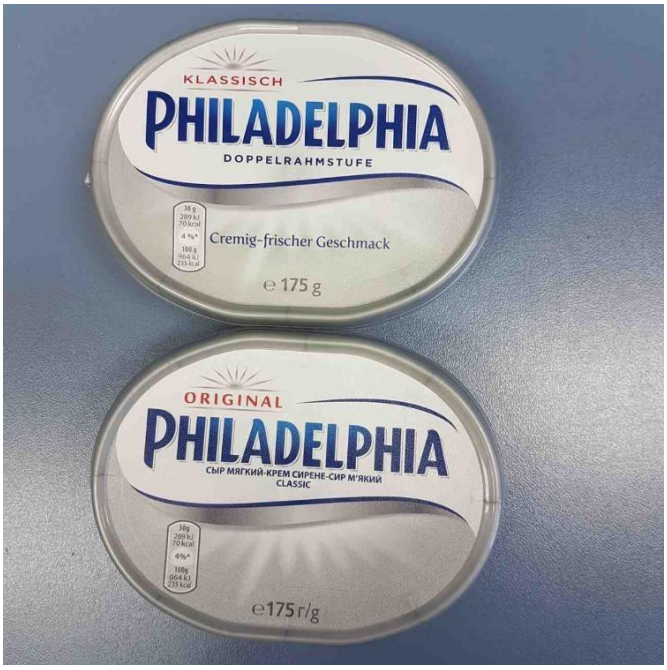
Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

The list of ingredients on the label referring to cereals, especially the ingredient included in allergens, is not in compliance with the Regulation (EU) 2011 on Food Consumer Information as of 25 October 2011, however, no difference in physical and chemical quality properties, and sensory quality properties, was noticed between the products intended for German and for Croatian markets.

3.2. 6. PHILADELPHIA SPREADABLE CREAM CHEESE - EXTRA FAT

Manufacturer: *Mondelez Production*



Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

dry matter

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Consumers on the German market have more complete information on the product, since the number of servings is not stated on the label contained in the pre-package on the Croatian market, which is mandatory pursuant to the Regulation (EU) 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information. Moreover, the product from the German market contained the calculation of the percentage share of nutrients per serving, expressed as a percentage of Recommended Dietary Allowance for average adult, and the same information is missing from the product from the Croatian market. However, no difference in physical and chemical quality properties, and sensory quality properties, was noticed between the products intended for German and for Croatian markets.

3.2. 7. HEINEKEN LIGHT LAGER BEER, PASTEURISED

Manufacturer: *Heineken*

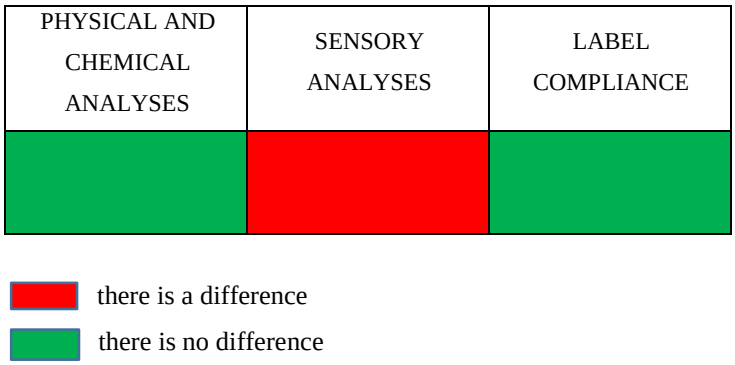
Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- sodium
- sorbic acid
- benzoic acid
- SO_2 content
- types of sugar (fructose, glucose, sucrose)
- basic wort extract
- ethanol contents
- beer bitterness
- beer colour
- CO2 contents

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:



Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Differences in taste and overall sensory evaluation of both products were noticed. The product from the Croatian market was evaluated as having a bitterer and fuller taste. The results of chemical analyses confirm the abovesaid, but they are in compliance with allowed tolerances.

Therefore, the said differences for these products are pointed out only via sensory analyses; therefore, we could say that it is consumer preference.

3. 2.8. COCA COLA ZERO, REFRESHING NON-ALCOHOLIC BEVERAGE WITH SWEETENERS

Manufacturer: *Coca-Cola Company*

Physical and chemical analyses:

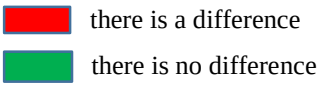
- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- sodium
- sorbic acid
- benzoic acid
- caffeine
- acesulfame – K
- aspartame
- saccharin
- cyclamate
- types of sugar (fructose, glucose, sucrose)
- phosphorous acid
- CO_2 contents

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE



Conclusion:

The differences between the tested amounts and the amounts of the nutrients specified on the label are in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

There is a significant difference in taste of the two analysed products, therefore, in this case we could say that it is consumer preference.

3.3. Products where difference in quality was not determined

3.3. 1. JACOBS CRONAT GOLD INSTANT COFFEE

Manufacturer: *Jacobs*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

sodium

caffeine

types of sugar (fructose, glucose, sucrose)

extract contents

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information, and there is no difference between the products intended for the two observed markets.

3.3.2. PEPSI COLA, CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE

Manufacturer: *Pepsi Co.*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

sodium

sorbic acid

benzoic acid

caffeine

acesulfame – K

aspartame

saccharin

cyclamate

types of sugar (fructose, glucose, sucrose)

phosphorous acid

CO_2 contents

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 3. HAPPY DAY 100 % ORANGE JUICE, MILD TASTE, FROM JUICE CONCENTRATE WITH CALCIUM

Manufacturer: *Rauch*

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- sodium
- sorbic acid
- benzoic acid
- acesulfame – K
- aspartame
- saccharin
- cyclamate
- types of sugar (fructose, glucose, sucrose)
- vitamin C
- fruit contents

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 4. RED BULL ENERY DRINK

Manufacturer: *Red Bull*

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- sodium
- sorbic acid
- benzoic acid
- caffeine
- acesulfame – K
- aspartame
- saccharin
- cyclamate
- types of sugar (fructose, glucose, sucrose)
- vitamins B_3, B_5, B_6, B_{12}
- CO_2 contents

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 5. MONTE CHOCOLATE MILK DESSERT

Manufacturer: *Zott*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 6. RIO MARE TUNA IN OLIVE OIL

Manufacturer: *Bolton Alimentari*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

dry matter

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 7. BARILLA SPAGHETTI, DRY PASTA FROM DURUM WHEAT SEMOLINA

Manufacturer: *Barilla*

Physical and chemical analyses:

nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)

checking product's net quantity of contents

acidity level

fibres

ash

water

detecting and quantification of *Triticum* aestivum in Triticum spp.

Sensory analyses:

triangle test

paired comparison test

evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 8. PRINGLES ORIGINAL, SALTY SNACK PRINGLES ORIGINAL

Manufacturer: *WMB Pringles*

UMA INVESTMENTS

Physical and chemical analyses:

- nutritive label check (energy, fat, saturated fat, carbohydrates, sugar, proteins, salt)
- checking product's net quantity of contents
- acidity level
- fibres
- ash
- moisture
- acrylamide

Sensory analyses:

- triangle test
- paired comparison test
- evaluation of the overall sensory quality by implementing the scoring system with 20 weighted points

Results:

PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

Taking into consideration the contents of the declaration, the analysed products are in compliance with the provisions of the Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information and there is no difference between the products intended for the two observed markets.

3.3. 9. LENOR FABRIC SOFTENER

Analyses were made in cooperation with *Department for General Use Items, Division for Environmental Health, of the Croatian Institute of Public Health in Zagreb* and *Faculty of Textile Technology University of Zagreb*.

Manufacturer: *Procter&Gamble*

Physical and chemical analyses:

- active agent (cationic tensides)
- fabric softening
- softening effect (hydrophilicity)
- viscosity
- dry matter
- organoleptics

Results:

PHYSICAL AND CHEMICAL ANALYSES	ORGANOLEPTICS	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the Ordinance of Detergents (OG 1/2011) with reference to REGULATION (EC) No 648/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 March 2004 on detergents.

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

3.3. 10. BREF POWER-GEL. TOTAL PROTECTION CLEANING AGENT

Manufacturer: *Henkel*

Physical and chemical analyses:

contents of total solubles in ethanol

acid contents

determining specific density

organoleptics

Results:

PHYSICAL AND CHEMICAL ANALYSES:	ORGANOLEPTICS	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, i.e. they are within the allowed tolerances, in compliance with the Ordinance of Detergents (OG 1/2011) with reference to REGULATION (EC) No 648/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 March 2004 on detergents.

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

3.3. 11. NIVEA SHOWER GEL

Analyses were made in cooperation with *Department for General Use Items, Division for Environmental Health, of the Croatian Institute of Public Health in Zagreb* and *Faculty of Textile Technology University of Zagreb*.

Manufacturer: *Beiersdorf A.G.*

Physical and chemical analyses:

- contents of total solubles in ethanol
- determining presence of parabens and fenoxietanol
- viscosity
- organoleptics

Results:

PHYSICAL AND CHEMICAL ANALYSES:	ORGANOLEPTICS	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, in compliance with the tolerances listed in the REGULATION (EC) No 1223/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2009 on cosmetic products.

Moreover, sensory analyses have shown that there is no difference in products intended for the Croatian i.e. for the German markets.

3.3. 12. COLGATE TOOTHPASTE

Manufacturer: *Colgate-Palmolive*

Physical and chemical analyses:

contents of total solubles in ethanol

fluoride contents

metal contents (Pb, Cd, Ni, Cr, Hg, As)

pulegone contents (essential oil component)

organoleptics

Results:

PHYSICAL AND CHEMICAL ANALYSES:	ORGANOLEPTICS	LABEL COMPLIANCE

there is a difference

there is no difference

Conclusion:

Pursuant to the performed physical and chemical analyses, we could say that identical products are present at both markets, or that the differences are marginal, in compliance with the REGULATION (EC) No 1223/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2009 on cosmetic products.

The aroma used on the German and Croatian markets originates from the mint essential oil, and significant difference of pulegone is natural variance of essential oils.

3.4. RAMA SPREAD

Manufacturer: *Unilever*

The first two products on the left picture (square shaped packaging) are products present on the Croatian market, while the third one (round shaped packaging) is a product from the German market

On German and Croatian markets there is no identical Rama spread, i.e. a spread with the same share of fat. Pursuant to *Regulation (EU) No. 1308/2013 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL*, the products from the group *Fats* are divided into *Margarine*, *Three-quarter fat margarine*, *Half-fat margarine*, and *Fat spreads X %.* At the moment of sampling, in all stores visited on the German market there was Rama fat spread with 70% fat, and on the Croatian market there were two types of Rama spread: three-quarter fat margarine with 60% fat, and Rama fatty spread with 48 % fat.

In conclusion, Rama with 70% fat sampled at the German market belongs to the category of *Fatty Spreads*, while Rama from the Croatian market with 60% fat is included into the category *Three-quarter fat margarine*. As the observed products belong to different categories of food products, we treated them as non-comparable and left them out of the total number of tested products.

4. CONCLUSIONS

- **Out of all analysed food products (21[1]), in 23.8 % (5 products) a great (statistically significant, $p < 0.05$) difference in quality was determined.**
- **Concerning the food products with small difference in quality (there were 8 products, i.e. 38.1 %),** in **3 products there was a difference in composition of the product intended for the Croatian and for the German markets**, while, from the aspect of labelling, i.e. compliance with the regulations on consumer information, **no difference in quality between the product intended for the Croatian and for the German markets was noticed in 3 products, but they were not in compliance with the Regulation (EU) No. 1169/2011** of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information, and **2 products differed by sensory properties**. All of the said products were in compliance with the tolerances listed in the Guiding Document (EC) on tolerances for nutrient values declared on labels (December 2012).
- The greatest difference in food products was the difference on the label (52.4 %), first of all in the list and the amount of the used ingredients (81.8 %)
- The difference in sensory properties was determined in 33.3 % of the food products.
- There were no fish sticks of the same producer on the Croatian and the German markets, therefore it was impossible to compare those types of products, as was planned in the first phase of the research.
- At the moment of sampling, in none of the visited stores on the German market was there available Rama spread with the same share of fat as the ones on the Croatian market (the product

[1] *From the total number of analysed products (22) we excluded Rama spread. At the moment of sampling in none of the visited stores on the German market was there available Rama spread with the same share of fat as on the Croatian market. As such, they, pursuant to the Regulation (EU) No. 1308/2013 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL, belong to different categories of food products, and are not comparable.*

from the German market contains 70 % fat, while the products from the Croatian market contain 60 % and 48 % fat). As such, they, in compliance with the Regulation (EU) No. 1308/2013, belong to different categories of food products, and are not comparable.

- **Out of the 5 products from the category of cleaning agents and personal hygiene, significant difference in quality was observed in 20% of the products (1 product),** which refers to the cleaning effect, composition of the product, dosing and organoleptic properties.
- When purchasing the products, 16 products (61.5%) had a higher price on the Croatian than on the German market, 1 product (3.8 %) had a higher price on the German market, while in 9 products (34.6 %) there was no difference in price (a deviation in price up to/and 10 % was treated as marginal difference, i.e. as if there was no difference).
- A difference was noticed in about one third of all analysed products, in the form and/or design of packaging, however, that is not relevant for the product quality.

5. LITERATURE

Analytical Chemistry of Foods, C.S.James, Aspen Publishers, Inc. Gaithersburg, Maryland 1999

Application Brochure 44, Selected Sodium Content Determinations for the Food and Beverage Industry, Mettler Toledo

CODEX STAN 166 – 1989 Codex Standard for quick frozen fish sticks (fish fingers), fish portions and fish fillets – breaded or in batter

Colours, synthetic, water-soluble. Liquid –chromatographic determination in foods (NMKL 130, 1989)

Food and feed products – General guidelines for the determination of nitrogen by the Kjelahl method (ISO 1871:2009)

Guidance document for competent authorities for the control of compliance with EU legislation with regard to the setting of tolerances for nutrient values declared on a label, December 2012

Hrana – Dokazivanje prisutnosti vitamina A tekućinskom kromatografijom visoke djelotvornosti – 1.dio: Mjerenje all-trans-retinola i 13-cis-retinola (HRN EN 12823-1:2014) - 2.dio: Mjerenje betakarotena (HRN EN 12823-2:2003)

Hrana – određivanje vitamina E tekućinskom kromatografijom visoke djelotvornosti – Mjerenje α-, β-, γ- i δ-tokoferola (HRN EN 12822:2014)

Identifikacija i kvantifikacija durum pšenica, PCR-microsatellite-based DNA analysis. Vlastita metoda

ISO 4120:2004 Sensory analysis - Methodology -- Triangle test

ISO 5492:2008 Sensory analysis – Vocabulary

ISO 5495:2005 Sensory analysis – Methodology – Paired comparison test

ISO 6658:2005 Sensory analysis – Methodology – General guidance

ISO 8586:2012 Sensory analysis - General guidelines for the selection, training and monitoring of selected assessors and expert sensory assessors

ISO 8589:2007 Sensory analysis - General guidance for the design of test rooms

Ispitivanje trans-masnih kiselina CG FID tehnikom, HRN EN ISO 12966-1,2,4

Ispitivanje ukupnih i bezmasnih kakao dijelova, spektrofotometrija. Vlastita metoda

Meso i mesni proizvodi - Određivanje hidroksiprolina (HRN ISO 3496:1999)

Meso i mesni proizvodi - Određivanje ukupne količine masti (HRN ISO 1443:1999)

Određivanje Akrilamida, LC-MS/MS* tehnika, RU-MET-160. Vlastita metoda

Određivanje boje u pivu, AOAC Official Method 976.08 (20st edition, 2016) Color of BeerOS (SOP-175-054)

Određivanje ekstrakta osnovne sladovine u pivu. AOAC Official Method Extract of Malt 935.30 (SOP-283-054).

Određivanje etanola u alkoholnim pićima gravimetrijski. AOAC Official Method 935.21, (SOP- 250-054).

Određivanje fosforne kiseline izražene kao P2O5 spektrofotometrijskom metododm u osvježavajućim bezalkoholnim pićima, Vlastita metoda (SOP101-054)

Određivanje gorčine piva. AOAC Official Method 970.16, Bitterness of Beer (SOP-325-054).

Određivanje hranjive vrijednosti, kombinacija tehnika

Određivanje kalcija, GF-AAS tehnika, RU-MET-113. Vlastita metoda

Određivanje kofeina i odabranih konzervansa u namirnicama HPLC tehnikom (Shimadzu LC- 2012 High Performance Liquid Chromatography Application Dana – Chromatogram of a Soft Drink) (SOP-84-053).

Određivanje kofeina, teofilina i teobromina HPLC tehnikom (Schweizerisches Lebens Mittelbuch (SLMB 22-4.3:2001) (SOP-238-053).

Određivanje količine dušika u hrani metodom po Kjeldahlu. ISO 1871:2009; HRN ISO 937:1999.

Određivanje količine proteina (dušik)a po Kjeldahlu u namirnicama*, RU-MET-159*

Određivanje količine vode gravimetrijski, HRN EN ISO 712:2010*

Određivanje koncentracije metala u hrani AAS i ICP-MS tehnikama. Vlastita metoda (SOP- 262-053 Izd. 01).

Određivanje konzistencije/viskoznosti viskozimetrom

Određivanje odabranih ugljikohidrata u sokovima, sirupima i dijetetskim sirupima HPLC- tehnikom. Vlastita metoda (SOP-91-053 Izd. 03/2016.)

Određivanje prehrambenih vlakana enzimatsko-gravimetrijskom tehnikom, AOAC metoda 985.29

Određivanje sadržaja vode u hrani. Vlastita metoda (SOP-98-054).

Određivanje SO_2 u namirnicama HPLC tehnikom (McFeeters R.F., Barish A.O. Sulfite analysis of fruits and vegetables by HPLC, Journal of agricultural and food Chemistry 51, 2003, 1513-1517) (SOP-236-053).

Određivanje stupnja kiselosti titracijski, ISO 7305:2002

Određivanje udjela cis-, trans-, zasićenih, jednostruko i višestruko nezasićenih masnih kiselina u hrani primjenom plinske kromatografije. HRN EN ISO 12966-1:2015, HRN EN ISO 12966-1:2015/Ispr. 1:2015, HRN EN ISO 12966-2:2011, HRN EN ISO 12966-4:2015, HRN ISO 15885:2003.

Određivanje udjela lješnjaka, gravimetrija. Vlastita metoda

Određivanje ukupnog pepela gravimetrijski, HRN EN ISO 2171:2010*

Određivanje ukupnog sadržaja masti u hrani. Vlastita metoda (SOP-95-054 Izd. 02/2014).

Određivanje vitamina B1 HPLC tehnikom, EN 14122:2006 mod.

Određivanje vitamina B12 HPLC tehnikom, AOAC 2008, vol. 9, No.4

Određivanje vitamina B2 HPLC tehnikom, EN 14152:2006 mod.

Određivanje vitamina B3 EN-HPLC tehnikom, EN15652:2009

Određivanje vitamina B5 LC-MS/MS tehnikom, AOAC 2012.16

Određivanje vitamina B6 HPLC tehnikom, EN 14164

Određivanje vitamina B8, LST AB 266.1:1995

Određivanje vitamina B9, MNKL No.11, 1985

Određivanje vitamina D3, HPLC tehnika, EN 12821:2009

Određivanje vitamina topljivih u vodi (Aplikacija proizvođača kolone) (SOP-235-053).
Određivanje vrste - profil šećera (fruktoza, glukoza, saharoza, laktoza), HPLC tehnika, RU_MET-093. Vlastita metoda

Određivanje željeza, GF-AAS tehnika, RU-MET-113. Vlastita metoda

Pravilnik o deterdžentima (NN br. 1/2011) (Regulation (EC) No. 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents)

Pravilnik o informiranju potrošača o hrani (N.N.08/2011)

Pravilnik o mesnim proizvodima (NN 131/2012)

Pravilnik o prerađenoj hrani na bazi žitarica i dječjoj hrani za dojenčad i malu djecu (NN 126/2013)

Pravilnik o sirevima i proizvodima od sireva (NN 020/2009, 141/2013)

Radna uputa za određivanje ukupnih ugljikohidrata, energije i soli računski (RU-31-054).

Udio jaja, gravimetrija
REGULATION (EU) No. 1308/2013 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 17 December 2013 on establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No. 922/72, (EEC) No. 234/79, (EC) No. 1037/2001 and (EC) No. 1234/2007.

Regulation (EC) No. 1223/2009 of the European Parliament and of the Council as of 30 November 2009 on cosmetic products.

COMMISSION REGULATION (EEC) No. 2568/91 as of 11 July 1991 on the characteristics of olive oil and olive-residue oil and on the relevant methods of analysis.

Regulation (EU) No. 1169/2011 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL as of 25 October 2011 on food consumer information

Regulation (EC) No. 853/2004 of the European Parliament and of the Council as of 29 April 2004, laying down specific hygiene rules for food of animal origin.

Commission Implementing Regulation (EU) No. 1208/2013, as of 25 November 2013 on approving minor amendments to the specification for a name entered in the register of protected designations of origin and protected geographical indications (Prosciutto di Parma (PDO))

Veratox® for Gliadin, ELISA Quantitative Test, Product 8480, Neogen Corporation, 2013, Neogen Europe

Weimar, A.; Nickel, B.; Sturman, H.W. Determination of the preservatives benzoic and sorbic acid in food by HPLC. Technical datasubject to change without notice 0.7/E/10/1993.

Zakon o informiranju potrošača (N.N. 56/2013)

Zakon o predmetima opće uporabe, NN 39/13, 47/14

Životinjske i biljne masti i ulja – Određivanje metilnih estera masnih kiselina plinskom kromatografijom - 1. dio: Smjernice za suvremenu plinsku kromatografiju metilnih estera (HRN EN ISO 12966-1:2015; HRN EN ISO 12966-1:2015/Ispr.1) - 2. dio: Priprava metilnih estera masnih kiselina (HRN EN ISO 12966-2:2011) - 4. dio: Metoda plinske kromatografije na kapilarnim kolonama (HRN EN ISO 12966-4:2015).

6. ANNEXES

6.1. Display of overall research results

MANUFACTURER	PRODUCT	PHYSICAL AND CHEMICAL ANALYSES	SENSORY ANALYSES	LABEL COMPLIANCE
Jacobs	**JACOBS CRONAT GOLD INSTANT COFFEE**			
Pepsi Co	**PEPSI COLA, CARBONATED REFRESHING NON-**			
Coca Cola	**COCA COLA, CARBONATED REFRESHING NON-**			
Coca Cola	**COCA COLA ZERO, REFRESHING NON-ALCOHOLIC BEVERAGE WITH SWEETENERS**			
Rauch	**HAPPY DAY 100 % ORANGE JUICE, MILD TASTE, FROM JUICE CONCENTRATE WITH CALCIUM**			
Beverage Partners Worldwide	**NESTEA ICE TEA, NON-CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE WITH TEA EXTRACT AND THE TASTE**			
Heineken	**HEINEKEN LIGHT BEER, PASTEURISED**			
Red Bull	**RED BULL, ENERY DRINK**			
Mondelez International	**MILKA, MILK CHOCOLATE WITH ALPINE MILK AND WHOLE HAZELNUTS**			
Ferrero	**NUTELLA, HAZELNUT AND CACAO CREAM PRODUCT**			
Haribo	**HARIBO HAPPY COLA, COLA FLAVOURED GUMMY CANDY**			

Mondelez Deutschland Production	**PHILADELPHIA SPREADABLE CREAM CHEESE - EXTRA FAT**			
Danone	**DANONE ACTIVIA BIFIDUS ACTIREGULARIS® STRAWBERRY FRUIT**			
Zott	**MONTE CHOCOLATE MILK DESSERT**			
Bolton Alimentari	**RIO MARE TUNA IN OLIVE OIL**			
Monini	**EXTRA-VIRGIN OLIVE OIL CLASSICO**			
Barilla	**BARILLA SPAGHETTI, DRY PASTA FROM DURUM WHEAT SEMOLINA**			
WMB Pringles/UMA INVESTMENTS	**PRINGLES ORIGINAL, SALTY SNACK PRINGLES ORIGINAL**			
AIA	**WUDY CHICKEN-AND-TURKEY FRANKFURTER WITHOUT FOIL**			
HIPP	**HIPP BABY FOOD - BIO RICE AND CARROT WITH TURKEY**			
Nestle	**NESQUIK, BREAKFAST CEREAL WITH THE TASTE OF CHOCOLATE, WITH ADDED**			
Protecter & Gamble	**ARIEL LAUNDRY DETERGENT POWDER**			
Procter & Gamble	**LENOR FABRIC SOFTENER**			
Henkel	**BREF POWER-GEL, TOTAL PROTECTION CLEANING AGENT**			
Beiersdorf	**NIVEA SHOWER GEL**			
Colgate- Palmolive	**COLGATE TOOTHPASTE**			

there is a difference

there is no difference

6.2. Comparison of the country of origin of the tested products from the Croatian and German markets

PRODUCT	MANUFACTURER ON THE CROATIAN MARKET	MANUFACTURER ON THE GERMAN MARKET
JACOBS CRONAT GOLD INSTANT COFFEE	Mondelez Deutschland Production GmbH&Co.KG, Bremen, Germany	Mondelez Deutschland Production GmbH&Co.KG, Bremen, Germany
PEPSI COLA, CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE	Pepsi Co., Voeslauer Mineralwasser AG,Bad Voeslau, Austria	PepsiCo,N.Y.,U.S.A., PepsiCo Deutschland GmbH D-63263 Neu-Isenburg
COCA COLA, CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE	THE COCA COLA COMPANY Coca-Cola HBC Hrvatska d.o.o. Zagreb, Croatia	THE COCA COLA COMPANY, Coca-Cola European Partners DE, Berlin
COCA COLA ZERO, REFRESHING NON-ALCOHOLIC BEVERAGE WITH SWEETENERS	THE COCA COLA COMPANY produced by Coca-Cola HBC Hrvatska d.o.o. Zagreb, Croatia	THE COCA COLA COMPANY, Coca-Cola European Partners DE, Berlin
HAPPY DAY 100 % ORANGE JUICE, MILD TASTE, FROM JUICE CONCENTRATE WITH CALCIUM	RAUCH Serbia d.o.o. 15220 Koceljeva, Serbia	RAUCH Fruchtsafte GmbH & Co OG A-6830 Rankweil, Austria
NESTEA ICE TEA, NON-CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE WITH TEA EXTRACT AND THE TASTE OF PEACH	Beverage Partners Worldwide (Europe) AG, Coca-Cola HBC Magyarorszag Kft., Hungary	Beverage Partners Worldwide (Europe) AG, distributed by Coca-Cola European Partners DE, Berlin
HEINEKEN LIGHT BEER, PASTEURISED	HEINEKEN HUNGARY Sorgyarak ZRT, H-9400 Sopron, Hungary	Heineken Brouwerijen B.V.,Amsterdam,Holland Heineken Deutschland GmbH, 10245 Berlin
RED BULL, ENERY DRINK	Red Bull GmbH, 5330 Fuschl am See, Austria	Red Bull GmbH, 5330 Fuschl Am See, Osterreich
MILKA, MILK CHOCOLATE WITH ALPINE MILK AND WHOLE HAZELNUTS	Mondelez, Bulgaria	Mondelez Deutschland D-288078 Bremen
NUTELLA, HAZELNUT CACAO CREAM PRODUCT	Ferrero, Poland	FERRERO MMXVII, D-60624 FRANKFURT/MAIN
HARIBO HAPPY COLA, COLA FLAVOURED GUMMY CANDY	HARIBO Betriebsges, m.b.H., A-4020 Linz/Austria	HARIBO D-53129, BONN
PHILADELPHIA SPREADABLE CREAM CHEESE - EXTRA FAT	Mondelez Deutschland Production GmbH&Co. KG, Bremen, Germany	Mondelez Deutschland Production GmbH&Co. KG, Bremen, Germany
DANONE ACTIVIA BIFIDUS ACTIREGULARIS® STRAWBERRY FRUIT YOGHURT	Danone GMBH D-81703, Munich	Danone GMBH D-81703 Munich
MONTE CHOCOLATE MILK DESSERT	Zott SE&Co KG D-86690 Mertingen Germany	Zott, D-86690 Mertingen
RIO MARE TUNA IN OLIVE OIL	BOLTON ALIMENTARI S.p.A.Cermenate, Italy	BOLTON ALIMENTARI S.p.A. Cermenate, Italy

EXTRA-VIRGIN OLIVE OIL CLASSICO	Monini S.p.A.-S.S.Flaminia Km129 - Spoleto Italia	Monini S.p.A.-S.S.Flaminia Km129 - Spoleto (Italy)
BARILLA SPAGHETTI, DRY PASTA FROM DURUM WHEAT SEMOLINA	Barilla G.e R. Fratelli, S.p.A Parma, Italy	Barilla G.e R. Fratelli, S.p.A Parma, Italy
PRINGLES ORIGINAL, SALTY SNACK PRINGLES ORIGINAL	UMA INVESTMENTS S.P. 99-300 KUTNO, Poland	WMB Pringles BVBA/SPRL 2800 Mechelen, Belgium
WUDY CHICKEN-AND-TURKEY FRANKFURTER WITHOUT FOIL	AIA S p. A S. Martino B.A.(VR) Italy	AIA S p. A S.Martino B.A.(VR) Italy
HIPP BABY FOOD - BIO RICE AND CARROT WITH TURKEY	HIPP Germany	HIPP Germany
NESQUIK, BREAKFAST CEREAL WITH THE TASTE OF CHOCOLATE, WITH ADDED VITAMINS AND MINERALS	CEREAL PARTNERS FRANCE 02240 Itancourt, France	****
ARIEL LAUNDRY DETERGENT POWDER	Procter & Gamble, Germany	Procter & Gamble
LENOR FABRIC SOFTENER	Procter & Gamble	Procter & Gamble
BREF POWER-GEL, TOTAL PROTECTION CLEANING AGENT	Henkel, Serbia	Henkel, Germany
NIVEA SHOWER GEL	Beiersdorf A.G, Germany	Beiersdorf A.G, Germany
COLGATE TOOTHPASTE	Colgate – Palmolive, Poland	Colgate – Palmolive, Poland

********the country of manufacturing is not stated on the label

6.3. Comparison of the price of the products from the Croatian and German markets

MANUFACTURER	PRODUCT	 PRICE IN CROATIA (HRK)	 PRICE IN GERMANY (HRK/EUR*)	DIFFERENCE IN PRICE (%)
Jacobs	**JACOBS CRONAT GOLD INSTANT COFFEE**	32.50 HRK/100 g	25.13 HRK/100 g 3.40 EUR/100 g	29
Pepsi Co	**PEPSI COLA, CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE**	0.60 HRK/100 ml	0.44 HRK/100 ml 0.06 EUR/100 ml	36
Coca Cola	**COCA COLA, CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE**	0.60 HRK/100 ml	0.59 HRK/100 ml 0.08 EUR/100 ml	2
Coca Cola	**COCA COLA ZERO, REFRESHING NON-ALCOHOLIC BEVERAGE WITH SWEETENERS**	0.60 HRK/100 ml	0.59 HRK/100 ml 0.08 EUR/100 ml	2
Rauch	**HAPPY DAY 100 % ORANGE JUICE, MILD TASTE, FROM JUICE CONCENTRATE WITH CALCIUM**	1.04 HRK/100 ml	1.11 HRK/100 ml 0.15 EUR/100 ml	7
Beverage Partners Worldwide	**NESTEA ICE TEA, NON-CARBONATED REFRESHING NON-ALCOHOLIC BEVERAGE WITH TEA EXTRACT AND THE TASTE OF PEACH**	0.60 HRK/100 ml	0.64 HRK/100 ml 0.09 EUR/100 ml	7
Heineken	**HEINEKEN LIGHT BEER, PASTEURISED**	2.42 HRK/100 ml	1.92 HRK/100 ml 0.26 EUR/100 ml	26
Red Bull	**RED BULL, ENERY DRINK**	4.00 HRK/100 ml	4.14 HRK/100 ml 0.56 EUR/100 ml	4

Mondelez International	**MILKA, MILK CHOCOLATE WITH ALPINE MILK AND WHOLE HAZELNUTS**	7.99 HRK/100 g	7.02 HRK/100 g 0.95 EUR/100 g	14
Ferrero	**NUTELLA, HAZELNUT AND CACAO CREAM PRODUCT**	5.87 HRK/100 g	4.58 HRK/100 g 0.62 EUR/100 g	28
Haribo	**HARIBO HAPPY COLA, COLA FLAVOURED GUMMY CANDY**	4.93 HRK/100 g	3.55 HRK/100 g 0.48 EUR/100 g	39
Mondelez Deutschland Production	**PHILADELPHIA SPREADABLE CREAM CHEESE - EXTRA FAT**	8.57 HRK/100 g	5.84 HRK/100 g 0.79 EUR/100 g	47
Danone	**DANONE ACTIVIA BIFIDUS ACTIREGULARIS® STRAWBERRY FRUIT YOGHURT**	2.80 HRK/100g	2.96 HRK/100 g 0.40 EUR/100 g	6
Zott	**MONTE CHOCOLATE MILK DESSERT**	4.73 HRK/100 g	3.47 HRK/100 g 0.47 EUR/100 g	36
Bolton Alimentari	**RIO MARE TUNA IN OLIVE OIL**	16.81 HRK/100 g	11.53 HRK/100 g 1.56 EUR/100 g	46
Monini	**EXTRA-VIRGIN OLIVE OIL CLASSICO**	7.50 HRK/100 ml	6.28 HRK/100 ml 0.85 EUR/100 ml	19
Barilla	**BARILLA SPAGHETTI, DRY PASTA FROM DURUM WHEAT SEMOLINA**	2.19 HRK/100 g	2.35 HRK/100 g 0.32 EUR/100 g	7
WMB Pringles/UMA INVESTMENTS	**PRINGLES ORIGINAL, SALTY SNACK PRINGLES ORIGINAL**	12.11 HRK/100 g	5.76 HRK/100 g 0.78 EUR/100 g	110
AIA	**WUDY CHICKEN-AND-TURKEY FRANKFURTER WITHOUT FOIL**	2.80 HRK/100 g	3.84 HRK/100 g 0.52 EUR/100 g	37
HIPP	**HIPP BABY FOOD - BIO RICE AND CARROT WITH TURKEY**	5.90 HRK/100 g	3.84 HRK/100g 0.52 EUR/100 g	54
Nestle	**NESQUIK, BREAKFAST CEREAL WITH THE TASTE OF CHOCOLATE WITH ADDED VITAMINS AND MINERALS**	5.33 HRK/100 g	5.69 HRK/100 g 0.77 EUR/100 g	7

Procter & Gamble	**ARIEL LAUNDRY DETERGENT POWDER**	3.38 HRK/100 g	2.73 HRK/100 g 0.37 EUR/100 g	24
Protecter & Gamble	**LENOR FABRIC SOFTENER**	1.37 HRK/100 ml	1.33 HRK/100 ml 0.18 EUR/100 ml	3
Henkel	**BREF POWER-GEL, TOTAL PROTECTION CLEANING AGENT**	2.40 HRK/100 ml	1.85 HRK/100 ml 0.25 EUR/100 ml	30
Beiersdorf	**NIVEA SHOWER GEL**	7.16 HRK/100 ml	4.58 HRK/100 ml 0.62 EUR/100 ml	56
Colgate- Palmolive	**COLGATE TOOTHPASTE**	16.79 HRK/100 ml	9.39 HRK/100 ml 1.27 EUR/100 ml	79

** € 1= HRK 7.39 (Mean exchange rate of CNB, on 23 August 2017)*

- there is a difference in price, the prices are higher in Croatia
- there is a difference in price, the prices are higher in Germany
- there is no difference in price, or the difference is marginal (deviation of up to 10 % was treated as a marginal difference)

NOTE: The said prices refer solely to the products at the moment of purchase.