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Food safety aspects in Hungary

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ABSTRACT

The theme of food safety was of high priority in the European Union accession and became indispensable in the international trade of foods as well as in the national sanitation and public health programs. Nowadays we devote more attention to food-related risks, while the presence of genetically modified ingredients in foods, the nutritional use of genetic modification are one of the most topical issues and fields of research. Since consumers cannot perceive most food safety hazards directly, beyond the tools of governmental food regulation and monitoring-sanctioning practice, risks can be reduced mainly through the continuous improvement of consumer knowledge. The research comprised the tracing of official food-control, as well as the analysis of consumers' opinion. We analysed the operation of the veterinary and food control stations of the counties and the capital. Sampling is followed by various organoleptic, physical, chemical, microbiological evaluations according to the needs. Failures found in the course of food quality inspections indicate that compositional failures, labelling deficiencies, organoleptic problems were the most common. The proportion of microbiological failures is much smaller, still it can be a relevant factor in triggering possible diseases. The lack of appropriate labelling may mislead customers and might have impact on the identibility and controllability of foods.
(Keywords: food quality standards, official food control)

Az élelmiszerminőség Magyarországon

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ÖSSZEFOGLALÁS

Az élelmiszer-biztonság témaköre kiemelt jelentőséggel bírt az Európai Unióhoz való csatlakozásban, és nélkülözhetetlenné vált az élelmiszerek nemzetközi forgalmában, valamint a hazai közegészségügyi és népegészségügyi programban. Manapság az élelemre vonatkozó kockázatokra fokozott figyelmet fordítunk, miközben a genetikai módosított anyagok jelenléte az élelmiszerekben, a génmódosítás táplálkozási felhasználása ma a legidőszerűbb vitatémák és kutatási területek egyike. Egyre nagyobb vita alakult ki a genetikailag módosított termékek gazdaság- és környezetbarát természetét illetően, és sok nemzetközi szervezet bonyolódott bele a GM termékek kockázati felbecsülésébe és biztonsági értékelésébe. Mivel az élelmiszer-biztonsági veszélyek jelentős részét a fogyasztók nem tudják közvetlenül észlelni, a kormányzati élelmiszer-szabályozás és ellenőrzési-szankcionálási gyakorlat eszközein túlmenően a kockázatok elsősorban a fogyasztói tudáskészlet folyamatos fejlesztésén keresztül mérsékelhetők. Kutatómunkánk a hatósági ellenőrzések követésére, valamint a fogyasztók véleményeinek a feldolgozására terjedt ki. A megyei és fővárosi állat-

egészségügyi és élelmiszerellenőrző állomások élelmiszer-minőségellenőrző tevékenységét elemeztük. A mintavételt követően a szükségleteknek megfelelően kerül sor a különböző érzékszervi, fizikai, vegyi, mikrobiológiai vizsgálatokra. Az élelmiszerek vizsgálata során feltárt kifogásolási okok közül az összetételi jellemzők kifogásolása, a jelöléssel kapcsolatos hiányosságok, az élelmiszerek érzékszervi tulajdonságát érintő kifogásolás a leggyakoribbak. A mikrobiológiai hibák aránya jóval kisebb mértékű, de még így is fontos tényező lehet az esetleges megbetegedések kiváltásában. A kifejezetten toxikológiai jellegű hibák aránya alacsony ugyan, de növekedési tendenciát mutat. Jelentősége azért nagy, mivel a veszélyes anyagok jelenléte veszélyeztetheti a fogyasztó egészségét, ugyanakkor a fogyasztók egyáltalán nem érzékelhetik ezeknek a veszélyes anyagoknak a jelenlétét. A korrekt jelölés hiánya félrevezetheti a vásárlót, és kihatással lehet az élelmiszerek azonosíthatóságára és ellenőrizhetőségére.
(Kulcsszavak: élelmiszer minőség, hatósági élelmiszer vizsgálat)

INTRODUCTION

Due to various economical and social factors the sources of food-safety risks have increased and the majority of them can not be detected by simple observation. At the same time, consumer expectations towards safety and within it food-safety significantly increased, as well (*Hámori*, 2007). As a significant part of food safety risks cannot be recognised directly by the consumers, the risks may be primarily reduced by a constant development of consumers' knowledge beyond the government's tools regarding food-regulation and monitoring-sanctioning practice (*Szakály and Berke*, 2004). To ensure the safety of food production, various legal regulations are in force for the production and partly for the storage of food. These specifications are in use constantly. It is the task of the monitoring authority to control the adherence of the legislations. The food control authority monitors the food producers, retailers and wholesalers with the management and supervisory ensured by the Veterinary and Food Control Station of the Hungarian Ministry of Agriculture and Rural Development (*Hungarian Food Safety Authority*, 2008). In the completion of the control plan they apply risk analysing tools, which covers the experiences gained at the producer or distributor, and on the other hand it takes into consideration the results of earlier primarily authority controls concerning food originating from there. The operation of the veterinary and food control stations of the counties and the capital is based on a work plan approved by the ministry. Food quality officers continuously control the validity of the legal regulations on food and of the instructions laid in the Codex Alimentarius Hungaricus, and also the adherence of legal and technological directions of the EU.

This study introduces certain aspects of food safety, the European Union's legislation (*REGULATION* (*EC*) *No 178/2002*) concerning food-safety and consumer protection, and it calls attention to the main problems on the basis of the analysis of time series provided by the *National Office for Food Control*.

MATERIALS AND METHODS

The study covered the tracing of official food-control, where secondary research was used to collect and systemise the existing information. In risk management, the number of necessary tests is defined on the basis of the risk estimation value. The testing and sampling pattern concerning food hygiene pertain to random samples. It does not cover the itemised controls and sampling, as well as those required by the monitoring system

and those ordered occasionally. Sampling is followed by various organoleptic, physical, chemical, microbiological and biological evaluations according to the needs. The most important surveillances are the general and specified bacteriological, food-microbiological, residuum toxicological, analytical, radiological and other surveillances. According to the methodology in force, specialised laboratories carry out food tests. Besides the observations found on site surveys, the (possibly positive) results obtained in the tests influence the eventual official judgment and the measures to be taken (*Hungarian Food Safety Authority*, 2008).

After the food hygienic test and survey, the authority for food control entitled to confiscate and destroy inconsumable food products. If it experiences shortcomings or disorders, the authority may temporarily or permanently waive the production or trade until the company fulfils the requirements.

The operation of food safety authority is based on the *FVM-ESZCSM-GKM ministries' joint regulation on official food control No. 92/2004.* (*V.25.*). The study analyses the annual results of food inspections in the scope of official food control (*Hungarian Central Office for Food Control*, 2004).

RESULTS AND DISCUSSION

The work of veterinary and food safety stations regarding food quality control was analysed at county level (and in Budapest) concerning the volume of their work and the types of inspections as well as the survey results obtained for certain food groups.

General data of the analysis

The number of food samples (21 891 items) officially inspected and the number of food samples examined from other approach (6 583 samples) show the national operation in year 2004 85.2% of the examined food samples met the requirements, thus the proportion of defective items was 14.8 per cent. In general, the number of inspected items decreased, and the percentage of defective food samples also decreased at the end of the period analysed.

The slight decrease in the number of defective food samples is not significant; although, strengthening of food quality control is worth further attention.

The slight increase in the number of other inspected items was due to an increasing demand on occasional inspections and on examinations done in cooperation with partner authorities, to consumer complaints and slightly to inspections related to claims on lengthening shelf-life. *Figure 1* shows the statistics of the number of inspected items and the percentage of defective items in official control of food quality between 1990 and 2004.

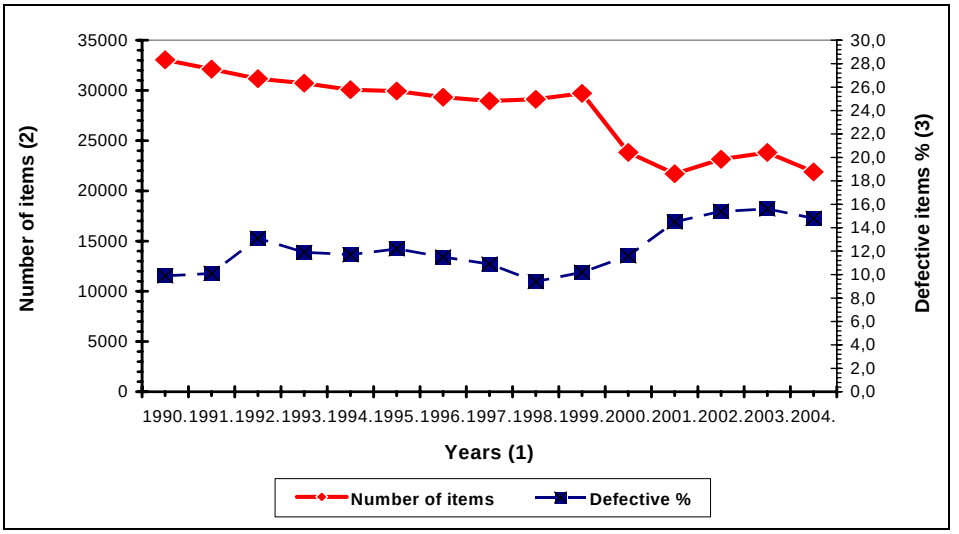
In official inspections, several examinations are carried out in case of each item. The total number of samples was 440 402 in the counties, and adding the number of samples inspected by the National Institute of Food Safety (OÉVI) these give up altogether 483 370.

The fields of inspections, the number of samples and the official and private values and the total values can be examined separately. The most frequent inspections are in relation to food microbiology (171 510 official inspections), giving almost half of the total samples, and together with the general and the specified bacteriologic examinations it gives more than half of the samples. Inspections for residuum toxicology and analytical inspections are also frequent. The percentage of other inspections represents more than 11%. The analysis of the data by product categories show that the highest number of samples is seen in case of meat and meat products, bakery products, milk and

dairy products and canned food; which together give up almost 60 percent of the total number of samples (22 026 official and 5 285 private).

Figure 1

Number of official food-quality analyses and the defective percentage between 1990 and 2004



Source (*Forrás*): Based on data of national food control (*Az élelmiszervizsgálati hatóság adatai alapján*)

1. ábra: Hatósági élelmiszer ellenőrzések száma és a kifogásolási százalék alakulása

Évek(1), Vizsgált tételek száma(2), Kifogásolási %(3)

The number of analytical food tests and the number of samples were analysed according to their territorial distribution, as well. Most of the analytical samples are seen in counties Borsod-Abaúj-Zemplén, Bács-Kiskun, and Veszprém, as well as in Budapest and Pest county (*Table 1*).

Authority enforcement activities

When the authority finds shortages in food-safety inspections, various official enactments can be enforced. Due to defective products, the food quality control authority imposed 3 184 quality protection fines, 28 infringement prosecution and took on-premise measures in 124 times. Not complying with the regulations or failing to meet the prescriptions (food production without permission, food-counterfeiting, mispresentation, use of forbidden materials or equipment) led to temporary prohibition of the production in 85 occasions by the authority (among them 25 bread and bakery products and 16 canned food products stood out), while the production of 72 products were prohibited permanently (67 sweets). In 109 occasions, the use of the food producing premises was temporarily prohibited, while 82 processing plants were closed down. Altogether 284 food batches were seized from food producers. Out of them, 64 lots were denoted for re-

processing, while 58 of them were directed for using as animal feed. 13 items were directed to other use. Those food items (149) containing injurious substances that were found unsuitable for use were destroyed.

The enforcement activity of official food quality control is shown in *Figure 2* between 1999 and 2004.

The data series show that the number of the most frequently applied quality protection penalties slightly decreased, as well as that of seized batches. The number of infringements decreased, and the number of penalties to be paid on the spot remained at the same level.

During the year, 4 318 out of 6 546 food processing plants were inspected (66.0%) by authority enforcement officers, in altogether 6 957 occasions. At 594 retailer and wholesaler 844 random tests were carried out by territorial inspectors.

Table 1

The annual number of analytical samples and food test by counties

County (1)	No. of samples (2)		No. of food tests (3)		Total(5)	
	Official (6)	Private (7)	Official	Private	No. of samples	No. of tests
Baranya	0	0	0	0	0	0
Bács-Kiskun	3 115	383	6 621	762	3 498	7 383
Békés	0	0	0	0	0	0
Borsod-Abaúj-Zemlén	4 001	328	10 627	1 152	4 329	11 779
Budapest	1 935	1 032	13 006	4 492	2 967	17 498
Csongrád	937	577	2 105	1 234	1 514	3 339
Fejér	590	507	1 540	1 175	1 097	2 715
Győr-Moson-Sopron	0	0	0	0	0	0
Hajdú-Bihar	1 636	238	5 725	506	1 874	6 231
Heves	71	26	211	48	97	259
Jász-Nagykun	1 099	34	6 514	60	1 133	6 574
Komárom-Esztergom	0	0	0	0	0	0
Nógrád	860	0	14 267	0	860	14 267
Somogy	1 528	321	7 838	722	1 849	8 560
Pest	1 622	195	57 768	986	1 817	58 754
Szabolcs-Szatmár	905	779	6 128	1 697	1 684	7 825
Tolna	382	116	4 287	233	498	4 520
Vas	0	0	0	0	0	0
Veszprém	3 158	205	8 126	587	3 363	8 713
Zala	0	0	0	0	0	0
OÉVI	187	544	586	1 695	731	2 281
Total:	22 026	5 285	145 349	15 349	27 311	160 698

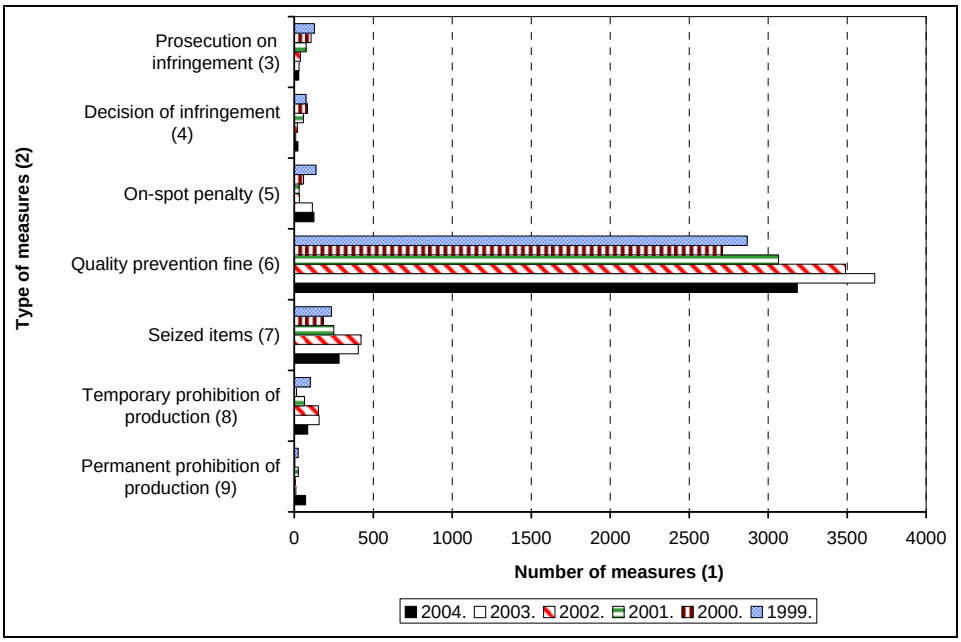
Source (*Forrás*): See *Figure 1* (*Lásd 1. ábra*)

1. táblázat: Analitikai mintaszámok és élelmiszervizsgálatok száma a megyékben és az OÉVI-nél

Megye(1), Mintaszám(2), Élelmiszer vizsgálati szám(3), Összesen(4), Hatósági(6), Magán(7)

Figure 2

Official food quality control enactments between 1999 and 2004



Source (*Forrás*): See *Figure 1* (*Lásd 1. ábra*)

2. ábra: Hatósági élelmiszervizsgálati intézkedések 1999 és 2004 között

Intézkedések száma(1) Intézkedés típusa(2), Szabálysértési feljelentés(3), Szabálysértési vizsgálat(4), Helyszíni bírság(5), Minőség-védelmi bírság(6), Elkobzott tételek(7), Időleges lezárás(8), Végleges bezárás(9),

The analysis of the data by product categories show that the highest number of samples was found seen in case of meat and meat products, bakery products, milk and dairy products and canned food; which together give up almost 60 percent of the total number of samples (22026 official and 5285 private).

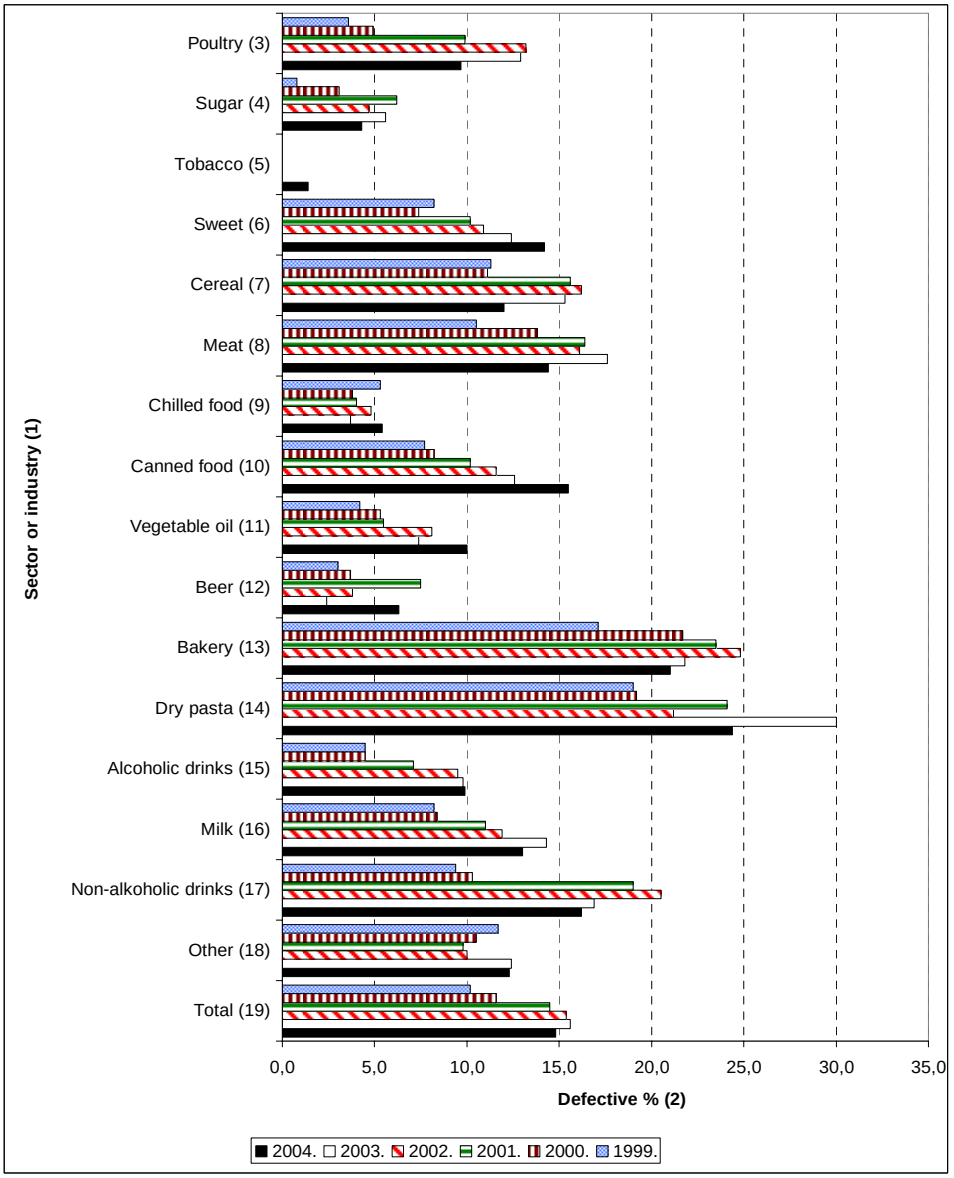
Food quality

In year 2004, 85.2% of the processed food products tested met the requirements. The analysis of the quality level of food compared the defective percentage to the previous year. The quality improved in the following sectors: dry pasta (5.6%), refreshment and water (3.6%), cereal products (3.3%), poultry products (3.2%), meat and meat products (3.2%), sugar (1.3%), milk and dairy products (1.3%). The quality of bread and bakery products, alcoholic drinks, and other food showed non-significant changes. Quality level decreased in the following sectors: beer (4.1%), canned food (2.9%), vegetable oil products (2.6%), sweets (1.8%), quick-frozen products (1.7%) and tobacco (1.4%).

Figure 3 shows the food quality in various sectors on the basis of the defective percentage.

Figure 3

Changes in food quality by sectors between 1999 and 2004



Source (*Forrás*): See *Figure 1* (*Lásd 1. ábra*)

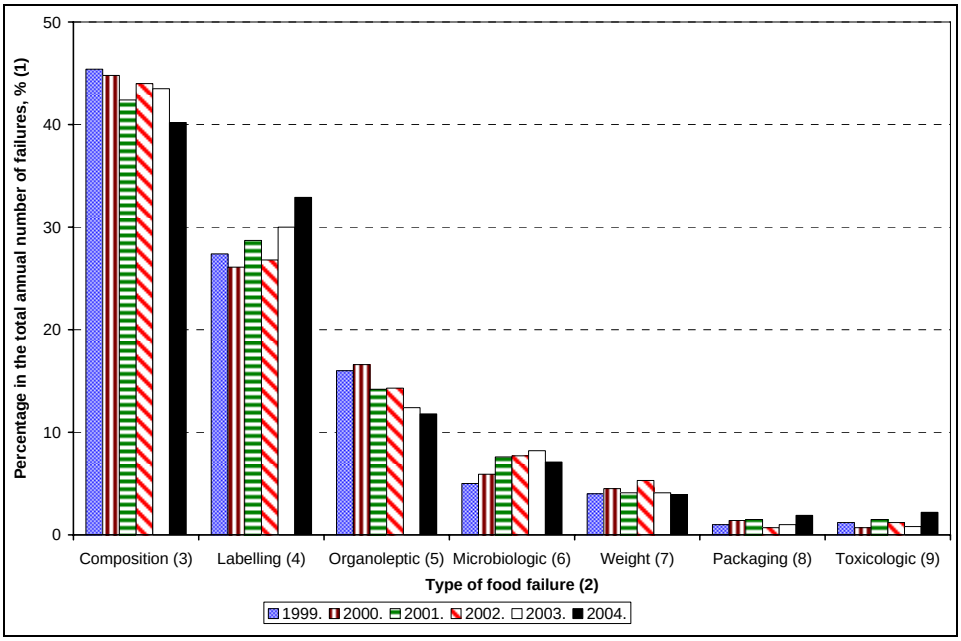
3. ábra: Az élelmiszerminőség alakulása szektoronként 1999 és 2004 között

Szektor vagy iparág(1), Kifogásolási %(2), Baromfi(3), Cukor(4), Cigaretta(5), Édesipar(6), Gabona(7), Hús(8), Hűtőipar(9), Konzervipar(10), Növényolaj(11), Sör(12), Sütőipar(13), Száraz tészta(14), Szesz(15), Tejtermék(16), Üdítőital(17), Egyéb(18), Összesen(19),

The percentage of various failures found in the course of food quality inspections indicates (*Figure 4*) that compositional failures were found most frequently (40.2%).

Figure 4

Types of food failure found between 1999 and 2004



Source (*Forrás*): See *Figure 1* (*Lásd 1. ábra*)

4. ábra: Kifogásolási okok alakulása 1999 és 2004 között

Az éves összes kifogásolási ok százalékában(1), Összetételi(2), Címkézés(3), Érzékszervi(4), Mikrobiológiai(5), Súly(6), Csomagolás(7), Toxikológiai(8), Kifogásolási ok(9)

These compositional failures can be identified only in laboratorial analyses. Certain sectors either were not able to guarantee the compositional properties or tried to gain extra profit directly by worsening the quality of the products. If this tendency continues, it will be reasonable to enhance the control of compositional properties, because this is the only way to secure the consumers' interests defined by the food law and the supply of the consumers with safety food.

The reason for the high proportion of compositional faults can be partly that the majority of the small and medium processing plants employing only a couple of people has not got efficient resources to maintain their own laboratories, and in order to reduce their costs they do not carry out quality analyses. The lack of equipment for food producers and the high share of the compositional failures of food make it reasonable that a strong food quality control network should operate with efficient technological, laboratorial and IT ground in Hungary.

The second most frequent type of failure is not meeting the legal requirements concerning labelling of food (32.9%), which practically reflects that every third food batches belong to this type of the failures.

Food labelling is of a great importance from food safety aspects. The producers should pay more attention on the information appearing in the label and on its quality.

Several times, producers used non-permitted substituents in conventional breads, or artificial sweeteners were added to bakery products made of fortified dough and these were not indicated in the label. Beside the labelling problems of Hungarian food, mispresentation of import products occurs, as well.

It is very important to reliably and promptly indicate the nature of the product (such as organic or GMO products) in order to enable the consumers to make their decision on shopping. It is also important to avoid confusing markers in the promotions of food.

Failures concerning organoleptic properties of food take the third place with 11.8 per cent. These types of failures (taste, smell, consistence, etc.) often relate to such further deficiencies that call the attention to further laboratory analyses (salty, bitter or sour taste not suiting to the nature of the product).

The percentage of microbiological faults is low (7.1%), although it is still a significant disease factor. It is obvious that microbiological failures highly threaten the consumers' health and the shelf life of the product. The number of food items with salmonella infection decreased; and Staphylococcus aureus infection is found only in dry pastas – primarily in those containing egg. The organoleptic test of the food often reveals microbiological problems (sour or mouldy taste).

The percentage of volume or weight failures is lower (3.9%). Part of these may originate in wrong set up of the equipment or technological indiscipline, and in the lack of continuous control.

Despite that the percentage of toxicological problems is low (2.2%), it is increasing. Its significance is great because toxins hazard consumers' health, while they do not even notice the presence of these harmful agents in the food.

Officers of food control agencies intend to improve the monitoring system and to impede and explore the uncontrolled import and in-EU food trade and basic or supplement materials of unknown quality to be used in processing plants. It is especially of great importance from the aspect of the preparations on unwanted appearing of toxicologically injurious substitutes.

The lowest percentage is represented by packaging problems (1.9%). It is difficult to keep pace with the continuously changing packaging systems while both the producers and the users are under high pressure. Harmonisation of the requirements is a complex task. It should not cause unwanted changes in the packed food, it should defend the food from external impact but also the packaging material itself should be environment friendly after the food had been consumed.

CONCLUSIONS

In all it can be established that the number of examined items dropped, the proportion of defective food products also diminished at the end of the examined period. However, the small-scale decline in the number of defective foodstuffs does not make considerable difference; strengthening of food quality control has to remain priority.

The slight increase in the number of other examined samples was due to the increase of claims in connection with partner authorities and special examinations, due to the investigation of customer complaints, as well as – though in small-scale – due to the investigations in connection with the extension of shelf life.

With regard to the distribution percentage of the defective proportion of problems revealed in the course of food inspection, defective component properties were the most

considerable. It deserves attention because customers neither see nor sense the inappropriate attributes of foods intended for consumption. In many cases the presence of components, which may cause damage on health (allergens), remains hidden.

These composition failures can be revealed only during laboratory analyses. In each of the industries the producers are either unable to guarantee component attributes, or they wish to gain profit knowingly, by quality deterioration. In case this tendency proceeds, the examination of component attributes and the increased inspections of them are justified since this is the only way to protect consumer welfare defined in the food law, as well as to provide consumers with safe food.

Most of the small and medium-sized enterprises as well as enterprises of 1-2 members do not have laboratories, which can be the reason on the one hand for the great proportion of composition failures. On the other hand, in order to save costs they do not even strive to carry out quality control or to have it done. The lack of laboratories and/or equipment and the great proportion of composition failures of the inspected foods account for the existence of the powerful Hungarian food-monitoring network, with sophisticated technical, laboratory, IT equipment.

The second failure reason of great proportion is deficiency, which derives either from the neglect of legal obligations related to labelling or from the deliberate avoidance of them. As for labelling, numerous failures have been revealed by the inspectors, which had serious impact on the identibility and controllability of foods from the viewpoint of rapid alert and recall system. Labelling food has major importance from the viewpoint of food safety. More attention ought to be paid to the information appearing on labels and its quality by producers. On several occasions unlicensed additives were used to bake conventional breads, or artificial sweeteners were added to pastries made from enriched dough; furthermore they were not labelled. Besides the labelling failures of domestic food, the inappropriate labelling of imported food also caused trouble in several cases.

Reliable, accurate labelling is of vital importance in the case of bio- and genetically modified products so that consumers can decide what they want to purchase. It is important to avoid using deceptive expressions (epithets) with marketing purpose.

Defective organoleptic attributes of foods was the third most common reason of positive analyses. The proportion of microbiological failures is small, however it is obvious that microbiological failures can be dangerous on consumers' health to a great extent, and also put the keeping quality of foods at risk. During the organoleptic judgement of foods it is often revealed that the products are defective even microbiologically.

Weight and volume deficiency was small-scale. It could be in part because of deliberate misrepresentation, and in part because of technological undisciplinarity, the lack of continuous inspection. Although the proportion of professedly toxicological failures is small, it shows an increasing tendency. Its significance is considerable since the presence of dangerous ingredients may put consumers' health at risk, while consumers can not sense the presence of these dangerous ingredients at all. The proportion of foods with packaging failures was the smallest. It is very difficult to keep up with the continuously changing packaging systems, while there is ever increasing pressure on both producers and users.

Food inspectors strive to improve the monitoring system, as well as to disclose and to prevent uncontrolled import, EU food distribution, unknown main and auxiliary ingredients from getting into plants. It is extremely important to be prepared for the unexpected appearance of toxicologically dangerous ingredients.

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