

PREPACKAGED PRODUCTS

Cooperation between three Nordic countries on market surveillance of e-marked prepackaged goods

HILLEVI STEIN, SWEDAC (Sweden)
KELD PALNER JACOBSEN, EFS (Denmark)
SARI HEMMINKI, TUKES (Finland)



Preface

This report has been produced jointly by the monitoring authorities of three Nordic countries: Sweden, Denmark and Finland. The authorities involved were the Swedish Board for Accreditation and Conformity Assessment (SWEDAC), the Danish Agency for Trade and Industry (EFS) and the Safety Technology Authority (TUKES) in Finland.

In order to maintain the credibility and the status of the e-mark, supervision in one form or another is necessary. From a Nordic point of view, it is important to ensure that the e-marking system leads to a common level of application all over the EU. Supervision is a safeguard for consumer protection but also for trade and industry, particularly as companies in the Nordic countries pay for the assessment that is necessary in order to obtain permission to use the e-mark. In some other countries in Europe this procedure is funded by the state.

This project and its results should be seen as a screening of the market in order to acquire an indication of the functioning of the market of prepackaged goods. Furthermore, the report will hopefully contribute to the e-marking discussion, both on Nordic and European levels.

The report will be presented to WELMEC, to the OIML and to the European Commission, and will also be distributed to the industry concerned, involved

competent departments, retailers' associations and consumers' organizations, etc.

1 Abstract

In 1999, the responsible legal metrology authorities in Sweden (SWEDAC), Denmark (EFS) and Finland (TUKES) started a joint market surveillance project on e-marked products. The objectives of the project were to develop an efficient method of monitoring products, to evaluate the benefits of cooperation and to investigate the current market situation of e-marked products, both in respect of accordance with the Directives concerning e-marking (75/106/EEC and 76/211/EEC) and the use of the e-mark.

The surveillance carried out included 23 e-marked prepackaged brands of products of seven different product categories. The net content of the packages was examined in order to determine the compliance with the Directives concerning e-marking. The results of the tests showed that all products, except one, clearly fulfil the requirements of net content.

Accredited laboratories carried out the tests, using the screening test method. Sample sizes were determined in a discretionary manner and then statistically evaluated (Student t-test). The screening test method used proved to be reliable and cost-efficient. The method could be useful in market surveillance to detect non-complying brands from among a large number for further examination.

The use of the e-mark on product labels was also investigated to evaluate the general knowledge of how to use the e-mark. 224 e-marked products of several product categories were examined. In 124 of these cases, the e-mark was found to be used incorrectly. The surveillance indicates that there may be confusion or lack of knowledge as to how to use the e-mark. Furthermore, it was found that the requirements concerning marking for identification of the packer were not fulfilled.

It is important that responsible bodies inform industry and packers about the rules concerning the e-mark in order to prevent incorrect use or even misuse. An equivalent level of surveillance in the EU countries would consolidate the status of the e-mark and, thereby, indirectly improve consumer protection and fair trade.

Cooperation of Nordic countries in market surveillance is a beneficial and cost-efficient way to gather information on the current market situation in this field. The markets in the Nordic countries are generally alike, therefore results obtained in one country can be used by another. Thus, cooperation and the exchange of information will also reduce the risk of doing the same work twice.

2 Introduction

2.1 Prepackages in the EU

The definition of a prepackage is, according to Community legislation, a product that has been “placed in a package of whatever nature without the purchaser being present and the quantity of product contained in the package has a predetermined value and cannot be altered without the package either being opened or undergoing a perceptible modification.

The e-symbol on prepackages is intended to be a proof that the goods have been packed in accordance with the requirements in the European Council Directives 76/211/EEC and 75/106/EEC. These Directives were issued in order to facilitate the free movement of prepackaged goods within the EEC for goods of 5 g to 10 kg (or 5 ml to 10 l). Now within the EU the e-mark is a “passport”; when goods cross borders, they are exempted from regular national testing in respect of weight and volume.

The use of the e-mark is optional. In the e-marking assessment process a competent department has to be involved; the competent department is responsible for approving the packer to use the e-mark and for the periodical control. If the goods are imported from a third country, the importer is responsible for ensuring that the products fulfil the requirements.

2.2 Requirements of the Directives

In the Directives, there are three main requirements for the quantity of the prepackage. Firstly, the actual content must not, on average, be less than the nominal quantity. This means that under-filling, within certain limits, is accepted as long as other prepackages of the same production are over-filled to an equivalent extent.

Table 1 Nominal quantity, Q_n , and tolerable negative error

Q_n in grams or millilitres	Tolerable negative error	
	% of Q_n	g or ml
From 5 to 50	9	
From 50 to 100		4.5
From 100 to 200	4.5	
From 200 to 300		9
From 300 to 500	3	
From 500 to 1 000		15
From 1 000 to 10 000	1.5	

Secondly, the proportion of prepackages having a negative error (i.e. under-filling) greater than the tolerable negative error laid down in the Directives, shall be “sufficiently small”. The notion “sufficiently small” is in practice set to 2.5 % of the production batch. That means that a maximum of 2.5 % of the prepackages are allowed to have a negative deviation from the nominal volume/weight greater than the tolerable negative error, shown in Table 1.

Thirdly, no individual prepackage having a negative deviation greater than twice the tolerable negative error according to Table 1 may bear the e-mark.

The packer shall measure the amount of product filled in every package during the packaging process, or check the contents of the packages by statistical methods. The equipment used for measuring or checking shall be legal and suitable. The checking procedures must be recognized by a competent department, and the packer is also obliged to keep records of results and adjustments at the disposal of the competent department.

Directive 76/211/EEC also prescribes that every prepackage shall have a mark or inscription enabling the competent department (or supervising authority) to identify the packer.

2.3 The need for supervision

Market surveillance is a tool to defend and sustain confidence in the e-mark. Misuse is a threat to competition on equal terms, consumer protection and free circulation of goods. As goods are traded across borders, cooperation between legal metrology authorities is important.

Tests performed by SWEDAC in 1997 indicated that e-marked products do not fulfil the requirements in the Directives. It was also found that non-approved e-mark products circulated on the market. Manufacturers having invested in production control must ensure that the system works out in practice. It is therefore important that authorities take actions when illegal use of the e-mark is detected.

2.4 Nordic market surveillance

The Nordic project on market surveillance is an attempt to investigate the functioning of the e-marking system. It includes quantity checks (screening tests) and checks on the labeling. The results should be seen as a screening of the market in order to obtain an indication of the functioning and also to provide a basis for discussion - both on Nordic and European levels.

3 Background

3.1 The Nordic market

Trade within the EU is constantly increasing and the turnover of the trade of prepackaged products in the Nordic area alone is estimated at about 50 billion €. Considering that amount, even small amounts of under-filling or over-filling may have large economic consequences on an aggregated level.

The range of prepackaged products on the different markets of the Nordic countries is fairly similar. This geographical area is therefore suitable for undertaking joint market surveillance actions.

3.2 The Nordic cooperation project

SWEDAC, the initiator of the project, invited the other Nordic countries to participate. The Danish Agency for Trade and Industry (EFS) in Denmark and the Safety Technology Authority (TUKES) in Finland responded positively to the request. In 1999, the responsible authorities in Sweden, Finland and Denmark agreed upon cooperation concerning a market surveillance project on e-marked prepackages.

Pre-packages had previously been submitted to tests in national market surveillance actions, but this was the first time such a project was jointly performed. Moreover, the test method was slightly different from a regular screening test. The tests contained fewer products in the samples than used in previous tests.

The method comprised the test method as well as the method for administrative cooperation. In the future this method, or parts of it, may be used as a model for similar joint market surveillance activities.

3.3 Objectives

The main objective was to perform tests of e-marked prepackages. As new methods were going to be used, the project also aimed to evaluate the test method.

The other important objective of the project was to evaluate the efficiency gains of the cooperation. Especially, it was of interest to evaluate if cooperation led to increased exchange of information and even more information with less effort. When cooperating, results and experience can be more efficiently exchanged. Furthermore, it ensures that work is not duplicated.

4 Experimental aspects

4.1 Laboratories

The responsible authorities in the participating countries planned the project. Sub-contractors, all of whom had the status of competent departments and accredited laboratories in Denmark, Finland and Sweden respectively, performed the fieldwork.

4.2 Test method

The surveillance was carried out by a screening test method. The test is complimentary to a reference test in a laboratory. However, no package is allowed to deviate negatively by more than the tolerable negative error, i.e. the tolerated level of proportion 2.5 % is not applicable here.

Tare weight was determined in a laboratory by examining the two heaviest and the two lightest packages of each brand. The packages were broken up and the average tare was determined by weighing the cleaned wrappings. The average density of the products was measured in an accredited mass laboratory.

In order to obtain statistically reliable results the sufficient sample size was determined by using existing test records of the verification made by the notified body or competent department that originally issued the e-marking permission to the brand of interest. The optimized sample size was calculated as described in formula (1) (see 4.3).

Test records of the verification were obtained by contacting the competent department concerned. If the records could not be found the sample size was determined in another way. Reliability of all results was examined by a t-test after the measurements.

4.3 Sample size method

In order to avoid high expenses it was agreed to perform a pre-investigation based on sample checks carried out by the competent department. By using the standard deviation, the necessary amount of pre-packages can be calculated, and thereby, sample sizes can be reduced.

Investigation plans were drawn up similarly in Sweden and Finland: both countries tested 10 different products and Denmark tested 3 products. For all 23 products the same statistical method was used. The model of calculation of sample size and evaluation is shown below.

Table 2 Products and origin of packers

Tested by	Product	Origin of products/packers
Denmark	Foods and sweets	Denmark
Finland	Cheese and lotion	Finland, Germany, United Kingdom, Denmark
Sweden	Toothpaste and shampoo	France, Germany, Netherlands, United Kingdom, Belgium

- 1) Data used form a normal distribution
- 2) Use of Student's t-distribution on 99.5 % reliability level
- 3) Use of formula
$$n = \left[t_{0.995v} \cdot \frac{s}{(\bar{x} - x_n)} \right]^2 \quad (1)$$

where:

- n = sample size
- $t_{0.995v}$ = t-value with 99.5 % reliability ($v = n - 1$) (Student's t-distribution)
- \bar{x} = mean value
- x_n = nominal value
- s = standard deviation

4.4 Products /packers

The origin of the e-marked products varied greatly, except for Denmark that exclusively tested Danish products.

Prepackages containing cosmetics/sanitary products such as lotion and shampoo, are to a large extent imported into the Nordic market, though all products tested were packed or produced inside the Union. The products Finland and Sweden tested originated from France, Germany and the United Kingdom (amongst others - see Table 2).

4.5 Criteria for acceptance and rejection

Since the screening test is very limited and the size of the batch is not known, the results cannot be used as a basis for deciding to reject a batch. However, when suspicious results are observed, the possibility to perform a complete reference test will be considered. It is then the present status of the prepackages at the packers' site that is checked. Alternatively, in case the historical data of the specific batch is more relevant, the competent department will be contacted.

5 Results

5.1 National report – Finland by Sari Hemminki, TUKES

National legislation

Legal metrology is based on the *Act on Weights and Measures* (219/65) and the *Decree on Weights and Measures* (370/92). Supported by the law, the Ministry of Trade and Affairs has issued *Regulations for Prepackages* (179/2000) and *Regulations for Measuring Container Bottles* (180/2000). EU Directives 75/106/EEC, 75/107/EEC, 76/211/EEC and 80/232/EEC are implemented by these regulations.

TUKES coordinates, supervises and controls the field of legal metrology in Finland. If regulations are violated, TUKES has the responsibility to take legal actions. TUKES is also responsible for the performance of market surveillance, among others the market surveillance of prepackaged products. Inspecta Oy (formerly Technical Inspection Centre) is responsible for granting the initial permission to use the e-mark and for periodical control of the prepackers; this permission is given by issuing a certificate upon evaluation and approval of the packing system. Evaluation of the packing system must be done within six months after the application is received.

Selected products

It was decided to perform the surveillance on two product categories: Finland chose to perform the test on prepackaged cheese and moisturizing lotion sold by weight or volume. Five e-marked brands of each category were randomly selected from a supermarket.

Background data

Competent departments that originally issued the permission to use the e-mark on the product were

contacted. Five of the products were packed in Germany, three in Finland and two in Denmark.

Previously recorded data could be found only for two examined brands. There were several reasons for this:

- The brand was not produced while the periodical controls on the packing line were made, so the statistical data could not be used.
- The packing system had not yet been evaluated.
- The responsible body could not be contacted since the packer of the product could not be found.

Experiment

The surveillance was carried out during January–February 2000. Measurements were performed in the field by a laboratory balance that was calibrated and adjusted before the tests by F_1 class weights. Inspecta Oy carried out the measurements.

In two cases, the sample size was determined from previously recorded data. For the other brands the necessary sample size was set at 22.

Tare weight was determined in a laboratory by examining the two heaviest and the two lightest packages of each brand. The packages were broken up and the average tare was determined by weighing the cleaned wrappings. The average density of the lotions was measured in an accredited mass laboratory.

The second part of the test was to investigate the labeling of e-marked products. This was done by checking the labeling of all e-marked products in three product categories found in one supermarket. The size and shape of the e-mark was checked in general and the identification of the packer or retailer in detail.

Results

The results of market surveillance are shown in Table 3.

Discussion

According to the results presented in Table 3 it can be deduced that no individual package had a net content under TU2. One brand of cheese had a net content under TU1. However, the same brand was also found to be significantly over-packed, so this does not yet indicate that the whole brand should be rejected. Relatively generous over-filling was also found for some other cheese products; this is understood to be due to the packing process and a fairly large standard deviation.

The net content of the lotions was in general found to be close to the nominal content. The standard deviation was quite small. The average net content of lotion B was slightly under the nominal content. Before

Table 3 Results, Finland

Product	Brand	Sample size	Nominal net content	Limit for TU1	Limit for TU2	Average net content	Standard deviation	No. of packages under	
								TU1	TU2
Cheese	A	22	350 g	339.5 g	329.0 g	366.01 g	13.38 g	1	0
	B	22	700 g	685 g	670 g	716.12 g	13.27 g	0	0
	C	22	500 g	485 g	470 g	518.38 g	17.70 g	0	0
	D	22	150 g	143.3 g	136.5 g	154.12 g	4.74 g	0	0
	E	22	200 g	191 g	182 g	200.92 g	0.82 g	0	0
Lotion	A	22	250 ml	241 ml	232 ml	250.91 ml	1.92 ml	0	0
	B	22	200 ml	191 ml	182 ml	199.93 ml	1.05 ml	0	0
	C	22	250 ml	241 ml	232 ml	251.46 ml	1.60 ml	0	0
	D	22	250 ml	241 ml	232 ml	250.28 ml	1.61 ml	0	0
	E	22	400 ml	388 ml	376 ml	400.83 ml	1.96 ml	0	0
	F	8	200 ml	191 ml	182 ml	203.93 ml	0.86 ml	0	0

Note: A summary of the results from investigation of the labeling of e-marked products is shown in Table 4.

Table 4 Results: Investigation into labeling

	No. of tested products	Incorrect e-mark	Defective identification of the packer/retailer	Percentage of defective labeling*
Flour, rice, pasta etc.	117	13	24	29.9 %
Canned food	54	8	13	38.9 %
Hygienic products	273	20	136	54.6 %
Total	444	41	173	46.2 %

* Percentage of packages with incorrect e-mark and/or insufficient data on the packer or retailer

making any further conclusions the reliability of the results must be evaluated.

The reliability of the results was calculated using formula (1) in 4.3 from test results presented in Table 3. The comparison of used and statistically calculated sample sizes can be found in Table 5.

According to the results the screening test was sufficiently reliable for cheese products. The results from lotions B and D cannot be reliably evaluated without further use of statistics presented in the e-marking Directive. In other words, the difference of the average net content of lotions B and D and the nominal net content is not statistically significant. Therefore the test results of these lotions are not reliable enough for the authorities to draw fundamental conclusions as to how the requirements of average net content are met without further investigations.

Labeling of e-marked products often seems to be insufficient. The e-mark was clearly incorrect in about 10 % of all items tested. According to the results the main problem seems to be in identifying the packer or retailer of the product. In nearly half of the products the identification was insufficient. In some cases there was no information concerning the packer or retailer at all. In some other products simply the country of origin was mentioned. In some other cases the retailer was not clearly identified from a group of contact addresses.

Conclusions

The screening test method used requires smaller samples sizes and is thus not as costly as the validation method described in the e-marking Directive. The results indicate that this method could be used in market surveillance to detect problematic brands from a larger group of prepackaged products. Using this method could be helpful when screening out the products that need to be examined more carefully.

It should be noted that the results obtained by this method only apply to the samples investigated, not the whole batch.

No significant under-filling was found for the tested products. However, the results on some lotion brands indicate that further investigations might be needed to ensure that they fulfil all of the requirements presented in the e-marking Directive.

Cooperation proved to be beneficial since the markets in the Nordic countries are generally alike. By cooperative evaluation it is possible to gather information on the current market situation more cost-effectively. The structures of supervision in the Nordic countries are quite similar to each other, which renders cooperation even more beneficial.

Using previously recorded data to calculate the suitable sample size seemed problematic. Due to the varying procedures in labeling and in granting permission to use the e-mark, there were problems in finding the correct competent department to obtain the

Table 5 Used and statistically calculated sample sizes

Product	Brand	Used sample size	Recalculated sample size
Cheese	A	22	6
	B	22	6
	C	22	8
	D	22	11
	E	22	7
Lotion	A	22	36
	B	22	1 804
	C	22	10
	D	22	275
	E	22	46
	F	8	1

Table 6 Results, Sweden

Product	Brand	Sample size	Nominal net content	Limit for TU 1	Limit for TU 2	Average net content	Standard deviation	No. of packages under	
								TU1	TU2
Toothpaste	A	30	75 ml	70.5 ml	66 ml	76.82 ml	0.43 ml	0	0
	B	10	75 ml	70.5 ml	66 ml	75.84 ml	0.15 ml	0	0
	C	30	75 ml	70.5 ml	66 ml	75.57 ml	0.19 ml	0	0
	D	23	75 ml	70.5 ml	66 ml	75.56 ml	1.10 ml	0	0
	E	30	75 ml	70.5 ml	66 ml	75.46 ml	0.34 ml	0	0
Shampoo	A	30	200 ml	191 ml	182 ml	200.56 ml	1.45 ml	0	0
	B	30	250 ml	241 ml	232 ml	252.69 ml	1.14 ml	0	0
	C	30	200 ml	191 ml	182 ml	204.51 ml	1.01 ml	0	0
	D	30	250 ml	241 ml	232 ml	254.72 ml	0.55 ml	0	0
	E	30	250 ml	241 ml	232 ml	250.85 ml	1.52 ml	0	0

necessary information. The necessary sample size was in most cases determined by relying on previous experience so that the tests would not be too time-consuming to carry out.

Labeling of e-marked products is crucial to be able to identify the packer or other responsible organizations. Lack of awareness and/or negligence of labeling rules of e-marked products also make it difficult to identify the packer. Although the e-marking Directive does not specifically require detailed information on the packer when the retailer is clearly identified, the experience from this investigation indicated that it is not obvious that the packer is known to the retailer either.

5.2 National report – Sweden by Hillevi Stein, SWEDAC

National legislation

SWEDAC is the central authority responsible for the regulation and supervision in the field of legal metrology in Sweden, where legal metrology is regulated by the *Act (1992:1514) concerning Quantity Units, Measurements and Measuring Devices* and the *Ordinance (1993:1066)* with the same name.

SWEDAC has issued administrative regulations in the field of legal metrology, *inter alia* concerning non-automatic weighing instruments, oil and petrol meters and prepackages. The EEC Directives 75/106/EEC, 75/107/EEC and 76/211/EEC are implemented in STAFS 1993:18. In application of the legislation, the main principle is to promote correction rather than to take legal actions against the packer. However, in the event of obvious violation of regulations, SWEDAC has the

power to issue a prohibition to put the prepackage on the market; the prohibition is usually combined with an administrative fine.

According to the EEC Directives, member states shall appoint a competent department responsible for performing official assessments required for e-marking. In Sweden, The Swedish National Testing and Research Institute (SP) has the status of a competent body. Companies that want to be approved to use the e-mark apply to SP for an assessment. SP makes an assessment of the capability of the packing system. If the system is found to fulfil the requirements, a certificate is issued.

Selected products

The number of categories of products submitted to tests was set at two. Sweden selected two chemical/sanitary products: shampoo and toothpaste. In each category of products, five e-marked brands were selected for testing.

The sample size was set at 30 except in two cases. For one of the products the sample size was calculated based on the standard deviation from the latest record from the competent department, (toothpaste B, 10). In another case, the sample size was set to the number of packages available in the shop (toothpaste D, 23).

Background data

The products were packed in the following countries: France (4), Belgium (2), United Kingdom (2), The Netherlands (1) and Germany (1).

Table 7 Used and statistically recalculated sample sizes

Product	Brand	Used sample size	Recalculated sample size
Toothpaste	A	30	1
	B	10	10
	C	30	1
	D	23	7
	E	30	2
Shampoo	A	30	8
	B	30	2
	C	30	1
	D	30	1
	E	30	24

Results

As shown in Table 6, no individual product had an actual net content under the double tolerable negative error, TU2, neither under TU1. All brands had on average a net content exceeding the nominal net content.

The net content of the toothpaste was found in general to be close to the nominal content. The standard deviation was quite small. For shampoo the standard deviation was slightly higher.

Discussion

When the results were ready, the sample sizes were evaluated by using formula (1) in 4.3. The calculation showed that the sample sizes in all cases were sufficiently large, and even excessively so. The comparison of used and statistically calculated sample sizes can be found in Table 7.

Conclusions

The test results show that all packers included in the Swedish tests seem to have a well functioning packing system. No under-filling was found and the standard deviation was small. The screening test and the sample sizes also proved to be reliable according to the checking calculations.

The general experience of the Swedish tests is that the products chosen were difficult to investigate. As the name of the packer was missing on the prepackages, it was not possible to identify the packer. Furthermore,

the prepackages were of big brands with a widespread organization and different production plants. Tracing the country and the packer of the goods was therefore the most crucial work. The main observation from the Swedish tests is that requirements concerning marking for identification of the packer according to the Directive were not fulfilled.

5.3 National report – Denmark by Keld Palner Jacobsen, Danish Agency for Trade and Industry

National legislation

In Denmark the basic legislation is collected in Law no. 142 of January 31, 1985 - elaborated by "The State Metrology Council".

Again, the above-mentioned legislation is elaborated based on:

- Law no. 173 of April 28, 1982, "Metrology";
- Law no. 646 of December 8, 1982, "Notification of The State Metrology Council"; and
- Danish Directive of January 31, 1985 (MDIR 35.00.1-01).

The above-mentioned legislation is elaborated based on the following EEC Directives:

- EEC-Directive of December 19, 1974 (75/106/EEC);
- EEC-Directive of November 23, 1979 (79/1005/EEC);
- EEC-Directive of January 20, 1976 (76/211/EEC); and
- EEC-Directive of September 28, 1978 (78/891/EEC).

Test method

The Danish market surveillance was divided into two types of investigations, as follows:

- 1) "Normal" sampling and investigation of sampled products by the notified body (FORCE Institute).
- 2) Investigation of the labeling on a broad range of products to be able to evaluate the general knowledge of how to use the e "labeling rules".

Table 8 Used and statistically calculated sample sizes

Product	Brand	Used sample size	Recalculated sample size
Paté	A	20	18
Cakes	B	10	3
Sweets	C	12	2

Table 9 Results, Denmark

Product	Brand	Sample size	Nominal net content	Limit for TU1	Limit for TU2	Average net content	Standard deviation	No. of packages under	
								TU1	TU2
Paté	A	20	170 g	162.35 g	154.7g	170.92 g	1.37g	0	0
Cakes	B	10	200 g	191 g	182 g	204.13 g	2.01 g	0	0
Sweets	C	12	16 g	14.56 g	13.2 g	16.69 g	0.27 g	0	0

Results

The FORCE Institute performed samplings of three different products. The test method used in all three cases was “individual tare weight”, meaning that the products were examined at the laboratory of the FORCE Institute (accredited laboratory).

The investigations were planned based on evaluations of earlier results from the same products.

This means that a calculation of the necessary amount of samples was done based on the newest actual data. Whether the calculated sample sizes were sufficient to draw any conclusions was, of course, reviewed after finalizing the investigations.

Investigation into labeling

The FORCE Institute also carried out an investigation into labeling; this took place in a big supermarket after the owner of the store in question had been thoroughly informed and briefed.

The aim of this part of the investigation was to gain an idea of the status of the knowledge and awareness of the rules according to the labeling of e-marked products. 224 different products were examined and the overall results are shown by country in Table 10.

Remark: In about 10 of the 224 cases it was not possible to clarify the origin of the product (i.e. the actual country in which the production took place). In those cases the “best guess” has been used to define the origin.

Discussion

The Danish results show that the tested prepackages fulfil the requirements in the e-marking Directives. Therefore, it seems that the production control implemented at the plant site and the efforts of the competent department are sufficient to secure adequate

accuracy of the content of the products. The investigation into how the rules of labeling according to e-marking are handled shows - as an overall picture - that there is a need for special activities in this area. This means that in Denmark the following initiatives will be taken:

- 1) The “e” will (in its correct graphic design and actual size) be placed on the Internet. Those producers and importers that have permission to e-mark will be given access to the e-mark. An approved packer/producer will need a password from the notified body to access the “e” on the Internet.
- 2) The information in Denmark concerning the labeling rules will be reviewed and changed.

Table 10 Results of investigation into labeling

Origin country of producer/packer	Correct e-mark	Incorrect e-mark
Belgium	4	3
Czech Republic		1
Denmark	32	29
France	5	14
Germany	12	19
Greece		1
Ireland		2
Italy	6	7
Monaco		2
New Zealand		1
Norway	1	1
Portugal	1	
Scotland		1
Spain	6	6
Sweden	3	2
Switzerland	5	5
The Netherlands	6	5
United Kingdom	16	19
USA	3	6
Total	100	124

Table 11 All test results

Product	Brand	Sample size	Nominal net content	Average net content	Standard deviation	No. of packages under		Expected percentage of packages under	
						TU1	TU2	TU1	TU2
Toothpaste	A	30	75 ml	76.82 ml	0.43 ml	0	0	0	0
	B	10	75 ml	75.84 ml	0.15 ml	0	0	0	0
	C	30	75 ml	75.57 ml	0.19 ml	0	0	0	0
	D	23	75 ml	75.56 ml	1.10 ml	0	0	0	0
	E	30	75 ml	75.46 ml	0.34 ml	0	0	0	0
Shampoo	A	30	200 ml	200.56 ml	1.45 ml	0	0	0	0
	B	30	250 ml	252.69 ml	1.14 ml	0	0	0	0
	C	30	200 ml	204.51 ml	1.01 ml	0	0	0	0
	D	30	250 ml	254.72 ml	0.55 ml	0	0	0	0
Cheese	A	22	350 g	366.01 g	13.38 g	1	0	2.60	0.33
	B	22	700 g	716.12 g	13.27 g	0	0	1.07	0.03
	C	22	500 g	518.38 g	17.70 g	0	0	3.22	0.37
	D	22	150 g	154.12 g	4.74 g	0	0	1.20	0.01
	E	22	200 g	200.92 g	0.82 g	0	0	0	0
Lotion	A	22	250 ml	250.91 ml	1.92 ml	0	0	0	0
	B	22	200 ml	199.93 ml	1.05 ml	0	0	0	0
	C	22	250 ml	251.46 ml	1.60 ml	0	0	0	0
	D	22	250 ml	250.28 ml	1.61 ml	0	0	0	0
	E	22	400 ml	400.83 ml	1.96 ml	0	0	0	0
	F	8	200 ml	203.93 ml	0.86 ml	0	0	0	0
Paté	A	20	170 g	170.92 g	1.37 g	0	0	0	0
Cakes	B	10	200 g	204.13 g	2.01 g	0	0	0	0
Sweets	C	12	16 g	16.69 g	0.27 g	0	0	0	0

3) Based on the investigation, the national authorities in the different countries will be contacted to clarify the situation. The status of the work within this item will of course be presented to WELMEC WG6 and WG5, among others.

Conclusion

The market surveillance performed by the notified body in Denmark shows that the three products examined all very clearly fulfil the demands concerning product content based on the reference test as formulated in the EEC Directive.

On the other hand the surveillance of the labeling shows that there seems to be a lack of awareness as to how to use the “e” and of the overall e-marking rules concerning labeling.

6 Combined results

Combined test results are shown in Table 11. The reliability of the results was reviewed by calculating the statistically optimized sample size after the experi-

ments. A comparison of the used and recalculated sample sizes can be found in Table 12.

The expected percentage of packages under TU1 and TU2 is also shown in Table 11. The statistical calculation is based on sample size, standard deviation and average net content (Students test 68.3). The results are also assumed to have a normal distribution. This gives an indication as to which products should be subjected to a follow-up in a reference test.

An evaluation of the sample size used (i.e. a recalculation of the sample size based on the standard deviation from the tests) is shown in Table 12.

For four products of the category “Lotion”, the sample size used was not sufficient according to the calculation. The high degree of overfilling of the pre-packages had a great impact on the variable n when using the formula in 4.3.

Results from the two investigations of labeling of e-marked products are presented in Tables 13 and 14.

Discussion

The results shown in Table 11 indicate that the net content of most examined prepackaged products fulfilled

Table 12 Comparison of used and evaluated sample size

Product	Brand	Sample size used	Recalculated sample size
Toothpaste	A	30	1
	B	10	10
	C	30	1
	D	23	7
	E	30	2
Shampoo	A	30	8
	B	30	2
	C	30	1
	D	30	1
	E	30	
Cheese	A	22	6
	B	22	6
	C	22	8
	D	22	11
	E	22	7
Lotion	A	22	36
	B	22	1 804
	C	22	10
	D	22	275
	E	22	46
	F	8	1
Paté	A	20	18
Cakes	B	10	3
Sweets	C	12	2

the requirements in the e-marking Directives. The sample sizes of some lotion products, though, were not sufficient in order to draw any reliable conclusions. This applies also to lotion B. For that product, the results, indicating a slight under-filling with average net content under nominal content, are not statistically reliable. The difference between nominal and average

net content is not significant. A reference test with a higher level of confidence would be needed to obtain reliable test results.

The situation concerning labeling and the extent of the use of the e-mark is not satisfactory: there seems to be confusion or lack of knowledge about the e-mark. It is important that responsible bodies inform industry and packers about the e-mark in order to counter incorrect use or even misuse of the e-mark. An equivalent level of surveillance in EU countries would consolidate the status of the e-mark and thereby indirectly improve consumer protection and fair trade.

7 Evaluation of results

7.1 Cooperation between Nordic countries

One of the objectives of the project was to evaluate the administrative cooperation. The main conclusions are presented below:

- 1) The overall judgement of the cooperation is that it has worked out extraordinarily well. Despite the geographical distance between the participants' offices, the work has been efficient.
- 2) At a very early stage, the participants agreed upon the importance of adhering to the time schedules. The final schedule was only about 1–2 weeks late, which is quite satisfactory.
- 3) The work was planned very carefully according to duties and time schedules. This made it possible to make changes during the work. The Danish initiative of investigating labeling was adopted as a part of the project by the other participants and also inspired Finland to do likewise.
- 4) It was possible to work closely together thanks to careful planning and clear goals. All the participants contributed equally and supported each other during the work.

Table 13 Investigation into labeling (Finland)

	No. of tested products	Incorrect e-mark	Defective identification of the packer/retailer	Percentage of defective labeling*
Flour, rice, pasta, etc.	117	13	24	29.9 %
Canned food	54	8	13	38.9 %
Hygienic products	273	20	136	54.6 %
Total	444	41	173	46.2 %

* Percentage of packages with incorrect e-mark and/or insufficient data on the packer or retailer

Table 14 Investigation into labeling (Denmark)

Producer/packer Country – origin	Correct e	Incorrect e
Belgium	4	3
Czech Republic		1
Denmark	32	29
France	5	14
Germany	12	19
Greece		1
Ireland		2
Italy	6	7
Monaco		2
New Zealand		1
Norway	1	1
Portugal	1	
Scotland		1
Spain	6	6
Sweden	3	2
Switzerland	5	5
The Netherlands	6	5
United Kingdom	16	19
USA	3	6
Total	100	124

7.2 Evaluation of the data

Altogether, the number of prepackages included in the tests was approximately 540. All tested products, except for one, clearly fulfil the requirements of net content laid down in the Directives. Most of the products in the test had a small standard deviation and were on average slightly over-filled. The overall evaluation for the products tested is that the production control is carefully planned. In this context the competent department plays an important role.

7.3 Evaluation of labeling

The Danish investigation into the labeling of e-marked products reflected a serious situation. As many as 124 out of 224 had incorrect marking. Many packers are unaware of how to label, i.e. to comply with the rules of the design of the e-symbol and the identification of the packer. The reasons for this can be summarized as:

- lack of knowledge of the rules; and
- insufficient information and guidance from authorities and competent departments.

8 Conclusions

Results

The test results show that all the products examined, except one, clearly fulfil the requirements of net content laid down in the Directive. Most of the packers included in the test seem to possess packing systems of a sufficiently high quality. No significant under-filling was found and the standard deviation of results was fairly small, except for some cheese products. Brands having a relatively large standard deviation were found to be slightly over-packed. The average net content of some lotions was found to be quite close to the nominal level. For these products the reliability of the test results was not sufficient enough to draw fundamental conclusions without further investigations.

The results from the investigation into the labeling of e-marked products showed that the situation is not satisfactory: there seems to be confusion or lack of knowledge about the e-mark. Also when it comes to marking the name and geographical code, etc. of the packer, the requirements were not fulfilled. Tracing the packing site and country was complicated. There were also difficulties in making contact with the relevant competent department.

It is important that responsible bodies inform industry and packers about the rules concerning the e-mark in order to prevent incorrect use or even misuse. An equivalent level of surveillance in EU countries would consolidate the status of the e-mark and, thereby, indirectly improve consumer protection and fair trade.

Method

The screening test method and the sample sizes were found to be reliable according to the calculations for all products, except for 4 products. Due to small sample sizes the costs of this method were reasonable. The results indicate that this method could be used in market surveillance to detect problematic brands from a larger group of prepackaged products. The method could be helpful when screening out the products that need to be examined more carefully.

The necessary sample size was originally conceived to be determined by using the standard deviation from the existing test records of the verification carried out by the competent department, though such information was difficult to obtain. In some cases the calculation was done based on the standard deviation from the record, in others it was done based on the standard deviation from the screening test.

Cooperation

Since the markets and structures of supervising authorities in the Nordic countries are generally alike, the results obtained were mutually useful and the cooperation as such proved to be beneficial. This examination showed that cooperation is a cost-efficient way of gathering information on the market situation; it also guarantees that work not is done twice. Co-operative market surveillance is a valuable way to exchange information and experience between European countries; this is also a way to contribute to the harmonization of the e-marking Directives.

9 Follow-up

Since the cooperation between the three participating countries worked out well, the experience from this project may be used as a basis for similar projects on market surveillance in the future.

The results from the investigation into the labeling of e-marked products show that the situation is apparently not satisfactory. Hence, there is a need for actions in this field. A follow-up to this project might be performed as a similar but more extensive investigation into the market. Or, a follow-up project might be of a more pro-active nature - such as a joint information campaign to packers. What will be done should be the topic for discussions in the three countries. ■

The Editors of the OIML Bulletin are grateful to the authors of this research project for kindly granting permission to reprint it.

*Originally published 22 June 2000
SWEDAC Doc. No. 0034 ISSN 1400-6138*

Contact information



HILLEVI STEIN
SWEDAC, Sweden
Tel.: (+46) 8 406 83 11
E-mail:
hillevi.stein@swedac.se



KELD PALNER JACOBSEN
EFS, Denmark
Tel.: (+45) 35 466 221
E-mail: kpj@efs.dk



SARI HEMMINKI
TUKES, Finland
Tel.: (+358) 9 616 72 44
E-mail:
sari.hemminki@tukes.fi