European Science and Technology Observatory

The impact of EU regulation on innovation of European industry

Pre-packaging sizes and the influence on innovation

Technical Report Series

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

Institute for Prospective Technological Studies

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ABOUT THE JRC-IPTS

The **Joint Research Centre** (JRC) is a Directorate-General of the European Commission, with approximately 2 100 staff members, the vast majority of whom come from the 15 Member States of the European Union. The Brussels Support Services (including the office of the Director-General and the Science Strategy Directorate) and seven institutes located in five different countries comprise the main organisational structure of the JRC (http//:www.jrc.org). The **mission of the JRC** is to provide customer-driven scientific and technical support for the conception, implementation and monitoring of EU policies.

The Institute for Prospective Technological Studies (IPTS) is one of the seven institutes making up the JRC. It was established in Seville, Spain, in September 1994.

The **mission of the IPTS** is to provide prospective techno-economic analyses in support of the European policy-making process. The IPTS' prime objectives are to monitor and analyse science and technology developments, their cross-sectoral impact, and their interrelationship with the socio-economic context and their implications for future policy development. The IPTS operates international networks, pools the expertise of high-level advisers, and presents information in a timely and synthetic fashion to policymakers (http//:www.jrc.es).

Although particular emphasis is placed on **key science and technology fields**, especially those that have a driving role and even the potential to reshape our society, important efforts are devoted to improving the understanding of the complex interactions between technology, the economy and society. Indeed, the impact of technology on society and, conversely, the way technological development is driven by societal changes, are **highly relevant themes within the European decision-making context**.

The **interdisciplinary prospective approach** adopted by the Institute is intended to provide European decision-makers with a deeper understanding of the emerging science and technology issues, and it complements the activities undertaken by other institutes of the Joint Research Centre.

The IPTS **approach** is to collect information about technological developments and their application in Europe and the world, analyse this information and transmit it in an accessible form to European decision-makers. This is implemented in the following **sectors of activity**: technologies for sustainable development, life sciences / information and communication technologies, -technology, employment, competitiveness and society -, futures project

In order to implement its mission, the Institute develops appropriate contacts, awareness and skills to anticipate and follow the agenda of the policy decision-makers. The **IPTS staff** is a mix of highly experienced engineers, scientists (life-, social- material- etc.) and economists. Cross-disciplinary experience is a necessary asset. The IPTS success is also based on its **networking capabilities and the quality of its networks** as enabling sources of relevant information. In fact, in addition to its own resources, the IPTS makes use of external advisory groups and operates a number of formal or informal networks. The most important is a network of European institutes (*the European Science and Technology Observatory*) working in similar areas. These networking activities enable the IPTS to draw on a large pool of available expertise, while allowing a continuous process of external peer-review of the in-house activities.

ABOUT ESTO

The European Science and Technology Observatory (ESTO) is a network of organisations operating as a virtual institute under the European Commission's – Joint Research Centre's (JRC's) Institute for Prospective Technological Studies (IPTS) - leadership and funding. The European Commission JRC-IPTS formally constituted, following a brief pilot period, the European Science and Technology Observatory (ESTO) in 1997. After a call for tender, the second formal contract for ESTO started on 1 May 2001 for a period of five years.

Today, **ESTO is presently composed of a core of 20 European institutions**, all with experience in the field of scientific and technological foresight, forecasting or assessment at the national level. These 19 organisations have a formal obligation towards the IPTS and are the nucleus of a far larger network. Membership is being continuously reviewed and expanded with a view to match the evolving needs of the IPTS and to incorporate new competent organisations from both inside and outside the EU. This includes the objective to broaden the operation of the ESTO network to include relevant partners from EU candidate countries. In line with the objective of supporting the JRC-IPTS work, ESTO **aims** at detecting, at an early stage, scientific or technological breakthroughs, trends and events of potential socio-economic importance, which may require action at a European decision-making level.

The ESTO **core-competence** therefore resides in prospective analysis and advice on S&T changes relevant to EU society, economy and policy.

The **main customer** for these activities is the JRC-IPTS, and through it, the European policy-makers, in particular within the European Commission and Parliament. ESTO also recognises and addresses the role of a much wider community, such as policymaking circles in the Member States and decision-makers in both non-governmental organisations and industry.

ESTO members, therefore, **share the responsibility** of supplying the IPTS with up-to-date and high-quality scientific and technological information drawn from all over the world, facilitated by the network's broad presence and linkages, including access to relevant knowledge within the JRC' institutes.

Currently, ESTO is engaged in the following **main activities.**

- A series of specific studies. These studies usually consist of comparing the situation, practices and/or experiences in various Member States, and can be of a different nature; (a) anticipation/prospective analysis, intended to act as a trigger for in-depth studies of European foresight nature, aiming at the identification and description of trends rather than static situations; (b) direct support of policies in preparation (ex-ante analysis); and (c) direct support of policies in action (ex-post analysis, anticipating future developments).
- Implementation of fast-track actions to provide quick responses to specific S&T assessment queries. On the other hand, they can precede or complement the abovementioned specific studies.
- To produce input to monitoring prospective S&T activities that serves as a basis of experience and information for all other tasks.
- ESTO develops an 'Alert/early warning' function by means of technology watch/thematic platforms activities. These actions are putting ESTO and JRC-IPTS in the position to be able to provide rapid responses to specific requests from European decision-makers.
- Support the production of '**The IPTS Report'**, a monthly journal targeted at European policy-makers and containing articles on science and technology developments, either not yet on the policy-makers' agenda, but likely to emerge there sooner or later.

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European Science and Technology Observatory

The impact of EU regulation on innovation of European industry

Pre-packaging sizes and the influence on innovation

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Executive Summary

Background and objectives

The European Commission has started a consultation with all main stakeholders of the pre-packaging chain with a view of publishing a green paper on pre-packaging. This green paper will be the basis for discussion on the review of current European regulation in the sector (pre-packaging Directive).

This study requested by the European Commission Directorate General Enterprise has been coordinated by Joint Research Centre's (JRC's) Institute for Prospective Technological Studies (IPTS). It aims at investigating the relationship between innovation and regulation in the pre-packaging sector with a particular focus on pre-packaging size regulation.

The study has been carried out by the European Science and Technology Observatory (ESTO). The ESTO is a network of organisations operating as a virtual institute under the European Commission DG JRC-IPTS.

The main objective of this analysis is to validate two main hypotheses:

1. mandatory pre-packed sizes do not hamper innovation in pre-packed sizes;
2. not prescribing pre-packed sizes induces innovation in pre-packed sizes

The investigation is based on a narrow but fairly representative number of case studies complemented with an in depth screening of European and non-European regulation concerning size of pre-packed products as well as a series of interviews and questionnaires addressed to the main stakeholders of the pre-packaging chain.

The study is based on broad definition of innovation that includes products, processes and organizational changes, a system perspective that looks to the entire chain of actors and the life cycle of a product/service from raw material to disposal.

Legislative Framework

The most important Council Directives in force concerning pre-packaging sizes are:

- Council Directive of 19 December 1974 on the approximation of the laws of the Member States relating to the make-up by volume of certain pre-packaged liquid (75/106/EEC) and
- Council Directive of 15 January 1980 on the approximation of the laws of the Member States relating to the ranges of nominal quantities and nominal capacities permitted for certain pre-packaged products (80/232/EEC).

The objective of these Directives is to harmonise conditions for the sales presentation of products which are already packaged and sealed, notably in order to ensure consumer information.

These Directives fix the volumes and the quantities in which liquids and non liquids (e.g. food stuffs and others) products are to be pre-packed. The Directives take into consideration about 50 types of products. Of these, only five have "mandatory values". The other products have ranges of optional values. For each product, the Directives provide for a range of sizes. Roughly three different categories can be distinguished: small (from one size to five sizes), medium (from six sizes to nine sizes) and large (from 10 sizes and more). The majority of the products with mandatory values (except "yellow wines") have a large range of sizes.

Four types of regulatory approaches have been identified, the values adopted at community level and at national level being the criterion on which the distinction is made. Thus we have:

1. Mandatory values prescribed by the Directives;
2. Optional values at Community level assimilated as optional at a national level;
3. Optional values at Community level assimilated as mandatory at a national level;
4. Values not included in the Directive's Annexes.

The analysis of the legislation in the United States of America and Canada on pre-packaging products shows that in those countries there aren't fixed ranges of sizes. In fact, except for some products (such as: wine, peanut butter, glucose syrup or refined sugar syrup in Canada; alcohol in United States), manufacturers are free to choose the sizes of the containers in which they could package the products. However, such containers may not be formed (filled or designed) in such a way as to mislead consumers.

Innovation framework

The pre-packaging chain is a very complex mixture of many different manufacturers and service providers. Moreover, various actors in the pre-packaging chain, like manufacturers of goods that need packaging, are also part of other production chains.

Size is just one of many features that are subject to changes when innovating a product. Innovations in packaging involving a change in size, usually originate from one of the following two forces: the use of size as a *marketing instrument* (to facilitate product differentiation and to better serve consumer needs) and the need of improving efficiency in *logistics* and to realise economies of scale.

In none of the cases was the innovation hampered by the existing regulatory regime on pack sizes. In some cases this is so because there is no regulation (yoghurt). In other cases the regulation does not cover the categories of multi-component products (frozen foods) or one-portion servings (coffee) in which the innovation has taken place. In the case of soft drinks, product innovation has been realised within the context of a mandatory range of prescribed quantities. The one case where we did not see product innovation is wine. Here it appears that the existing mandatory range of pack sizes allows producers to serve their customers with all possible functions.

Conclusions

It is not possible to make a general, straightforward statement about the relationship between regulation of pack sizes and innovation in the packaging chain. Whether pack sizes regulation positively or negatively influences innovation, or has an impact at all on innovation, depends on the outcome of the interplay between numerous other factors. It follows that the two initial hypothesis (regulation does not hamper innovation/not regulating induces innovation) can only be answered on a case-by-case basis.

In general, *the more complex is the chain of processes* to supply the (final) product or service to the customer, the *more restrictive is the effect of prescribed quantities*. For simpler, 'semi-commodity' products, mandatory standardisation of sizes may introduce a measure of rigidity in the market which is actually beneficial for innovation.

We saw that in all but one of the studied cases (i.e. wine) of one particular type of innovation involving packaging – i.e. product innovation consisting of the development of multi-component products that tend to be served in one-portion servings – pack size regulation did not apply. It would, however, be premature to conclude from this correlation that there is a positive relationship between the absence of regulation and innovation.

Three main policy alternatives have been presented:

1. *Harmonisation*: adopt all exiting national legislation for pack sizes, to introduce mandatory ranges for all products now regulated;
2. *Liberalisation*: abstain from all pack size regulation; in those cases where there is now regulation in place, this implies deregulation, some cases, this option may induce self regulation by industry;
3. *Mixed approach*: harmonise the pack size regulation for some products[1] and abstain from regulating the pack sizes of other products (this may in some cases imply liberalisation and lead to self regulation by industry, in others not)

In principle, the "mixed approach" seems to be the preferred one, even though *the results of our theoretical and empirical research do not support any general statement about the desirability of either harmonising the regulation on pack sizes with a view on stimulating innovation in the packaging chain or the abstention of such regulation.*

We have come to believe that the product is the better starting point for the design of pack size regulation than packaging itself. It follows that the integration of pack size regulation in vertical or 'recipe' regulation was a better approach than its integration in a body of legislation addressing packaging in general.

[1] Such as, for example, products charged with an excise tax (e.g. spirits)

CONTENTS

1. Introduction

1.1. Background information

The European Commission has started a consultation with all main stakeholders of the pre-packaging chain with a view to developing a green paper on pre-packaging. Pre-packed goods show great diversity over sectors. Various EU directives provide both mandatory and optional ranges of sizes for pre-packed goods, resulting in many sizes of pre-packed goods being marketed within Europe, often differing per country. In general three types of regulation exist, all aiming at different products.

- Mandatory values are prescribed by EU directives.
- Optional values at Community level are assimilated as optional at national level.
- Optional values at Community level are assimilated as mandatory at national level.

A fourth option concerns all products that are not mentioned in the annexes to one of the directives and whose ranges of sizes are not regulated at all.

The SLIM IV exercise on pre-packaging showed different views among sectors and advised that, where it is deemed necessary to harmonise pre-packed sizes, they should be mandatory and easy to change. The Commission underline the need of a coherent justification, based on a clear 'public interest' and in line with the main tenants of EU policy, for legislating package sizes.

An important issue for the Commission is the effect of legislation on innovation in pre-packed sizes. Relevant hypotheses to validate are:

1. mandatory pre-packed sizes do not hamper innovation in pre-packed sizes;
2. not prescribing pre-packed sizes induces innovation in pre-packed sizes

The Institute for Prospective Technological Studies (IPTS), as part of the Joint Research Centre of the European Commission, has asked TNO STB to conduct this study and to validate the aforementioned hypotheses.

1.2. This report

This report summarises the voyage the researchers have undertaken in order to validate the two hypotheses.

First, in Chapter 2, the methodology is presented. Next, in Chapter 3, an overview is given of the various EU directives and national regulations concerning pre-packed sizes. This is followed in Chapter 4 by a brief presentation of the pre-packaging chain, including main drivers and features for innovation. Then, in Chapter 5, the 'lessons

learnt' are presented. These are based on an analysis of the relevant information concerning regulation and innovation, combined with numerous interviews with actors involved. Finally in Chapter 6, the hypotheses are validated and some overall conclusions are drawn.

2. Methodology

The main goal of the research is to offer insight into the innovation effect of regulation alternatives on pre-packaging ranges. In order to achieve this goal the following steps have been taken.

1. An overview has been made, based on desk research, of regulation concerning pre-packed sizes within the EU, both at EU and Member State level. For reasons of comparison, a brief description of regulation in the United States and Canada has been added. The result of this exercise is a collection of possible regulatory scenarios (see Chapter 3).

2. By means of desk research and interviews with experts in the packaging sector, the actors in the pre-packaging chain have been identified, as well as important drivers for innovation and features that are most likely to be changed when innovation takes place in the pre-packaging chain. This has resulted in an overview of actors, drivers for innovation and a typification of innovation in pre-packaging (see Chapter 4).

3. The core of the project is a participative analysis of the impact of regulation in pre-packaging innovation. Based on the results of the desk research, several case studies were made. As it turned out to be very difficult to draw unambiguous conclusions concerning the complex relation between regulation and innovation in the pre-packaging chain, more in-depth insight was needed. Case studies are a better instrument to gain this more detailed knowledge than the survey that was foreseen in the original research plan.

In total, around 15 face-to-face interviews have been conducted in this stage of the project. During these interviews a standard questionnaire was used, expanded with some questions that had been adapted to the specific situation of the actor. Each interviewee received the questionnaire in advance in order to prepare for the meeting. The questionnaire has been improved during the entire project.

Based on information from the interviews and results from the earlier analysis, five products were selected for closer scrutiny. Various aspects have been taken into account when selecting the specific products:

- the products addressed face different regulatory regimes (mandatory, optional, none);
- the products are part of the food sector, since desk research showed that this sector is very susceptible to innovation in general and innovation concerning pack sizes in particular;

- the innovations concerning these products, are driven by various drivers (changing consumer demand, minimising costs and proving brand identity) and were aimed at different features (changing material, graphical design, different packaging function).

The result consists of five illustrations: soft drinks, coffee, wine, yoghurt and frozen food (see Chapter 5).

4. Next, based on all the information, the hypotheses were validated and some conclusions were drawn (see Chapter 6).

5. Finally, an interactive workshop was organised. Besides the project team, some packaging experts and interviewees also attended this meeting. During the workshop, the preliminary results were presented and discussed, based on a draft version of this report ([2]). The most important results of this workshop have been incorporated in both the conclusions and the recommendations (see Chapter 6).

([2]) A draft version of this report has been sent to all actors that have been interviewed.

3. Regulation in pre-packaging sizes

3.1. Introduction

This part of the research analyses the current legislation concerning ranges of pre-packaging sizes. In order to make this analysis, the following steps have been taken:

1. to analyse Community Directives 75/106/EEC and 80/232/EEC;
2. to compare the Directives to single national legislation of EEC Member States, thus finding the common aspects and the differences and establishing whether a harmonisation could benefit free trade or not;
3. to study the legislation in Canada and the United States concerning pre-packaging sizes, thus finding an innovative support in an eventual change at European level.

The aim of every step is:

(a) to evaluate whether and to what degree changes in the current Community regulations have an effect on technological innovations and on the free movement of goods within the Common Market;
(b) to evaluate whether and to what degree changes in the current Community regulations have an effect on consumer protection;
(c) to propose some alternative regulatory scenarios which could possibly be adopted.

3.2. Community legislation: understanding of the Directives

The most important Council directives in force concerning pre-packaging sizes are:

- Council Directive of 19 December 1974 on the approximation of the laws of the Member States relating to the make-up by volume of certain pre-packaged liquid (75/106/EEC) and
- Council Directive of 15 January 1980 on the approximation of the laws of the Member States relating to the ranges of nominal quantities and nominal capacities permitted for certain pre-packaged products (80/232/EEC)([3]).

The objective of these directives is to harmonise conditions for the sales presentation of products which are already packaged and sealed, notably in order to ensure consumer information (see Tables 1 and 2).

([3]) The directives concentrate on products marketed 'pre-packaged'. This means 'the combination of a product and the individual package in which such product is pre-packed', in the absence of the purchaser and in a way that the quantity of the product contained in the pre-package has a pre-determined value which cannot be modified without having to open the packaging or subjecting it to visibly noticeable modifications.

The directives take about 50 types of product into consideration. Of these, only five have 'mandatory values'. The other products have ranges of optional values. For each product, the directives provide for a range of sizes (see Tables 3 and 4). Roughly three different categories can be distinguished: small (from one size to five sizes), medium (from six sizes to nine sizes) and large (10 sizes and more). These charts show that the majority of the products with mandatory values (except 'yellow wines') have a large range of sizes.

Conversely, there isn't a constant relationship between optional values and type of range for all the other products. If the mandatory ranges of sizes are large, greater flexibility is given to the producer, since he can choose among the numerous sizes provided for by the directive. However, if the mandatory ranges of sizes are small, there is less such flexibility for producers, but on the other hand, consumers may be better protected.

As far as the optional values are concerned, it is more important to analyse the national legislation, in order to review if such ranges are kept optional or are transposed as mandatory. That is important for evaluating the market and consumer protection policy.

3.2.1. Council Directive of 19 December 1974, 75/106/EEC.

Directive 75/106/EEC, as amended by Directives 78/891/EEC, 79/1005/EEC; 85/10/EEC, 88/316/EEC and 89/676/EEC, provides for the pre-packaging by volume of some liquid products placed in a package, of whatever nature and in determined quantity, without the purchaser being present ([4]).

In its original edition, Directive 75/106/EEC aimed towards a complete harmonisation of the relative national legal frameworks. Particularly Article 4 n.2 which excluded the marketing of pre-packaging by nominal volumes, not included among those provided for by Annex III and the subsequent Article 5 prohibited Member States from adopting restrictive regulations regarding the market introduction of those products which respect the provisions of such a directive.

After the abrogation of Article 4 n.2 ([5]), Directive 75/106/EEC became a partially harmonising directive, considering that Member States have been authorised to allow the marketing of nominal volume pre-packaging not included among those provided for by Annex III to the directive.

The principal goals of the directive are (see Table 1):

1. to eliminate barriers to trade;
2. to protect consumers;
3. to facilitate inter-Community trade, by gradually approximating each single national legislative framework in matters ([6])

([4]) The later *Council Directive of 29 September 1976 on the approximation of the laws of the Member States relating to the make-up by mass or by volume of certain pre-packaged products* (76/211/EEC), recalling the protocol of Directive 75/106/EEC, regulates pre-packaging of products which were not provided for by the latter (liquid or/and non-liquid).
([5]) Carried out by Directive 79/1005/EEC.
([6]) See Annex III to Directive 75/106/EEC: column referring to c.d. 'temporary allowed'.

Table 1

Council Directive 75/106/EEC on the approximation of the laws of the Member States relating to the make-up by volume of certain pre-packaged liquids		
Objectives	**Field of application**	**Contents**
1. TO ELIMINATE BARRIERS TO TRADE: the conditions of presentation for the sale of liquids in pre-packages were the subject of mandatory regulations different from one Member State to another. 2. TO PROTECT CONSUMERS: reducing as far as possible the numbers of volume of contents that are too close to others of the same products and which consequently could mislead the consumers. 3. GRADUAL APPROXIMATION: in view of the extremely high stocks of pre-packages in the Community.	Packages containing the liquid products listed in Annex III, measured by volume and intended for sale in unit quantities varying between 5 ml and 10 l. The Directive doesn't cover: • wines of fresh grapes and fresh grape musts with fermentation arrested by the additional alcohol, packaged in volumes of less than 0.25 l and intended for professional use; • sparkling wines, alcoholic drinks, brandies and spirits intended for supplying aeroplanes, ships and trains, or for sale in duty-free shops.	OPTIONAL VALUES: Member States cannot refuse, prohibit or restrict the placing on the market of pre-packages which satisfies the requirements and tests laid down in the Directive for reasons concerning: • their nominal volumes, where these are set out in Annex III, column I; • the determination of these volumes. MANDATORY VALUES: Pre-packages listed in points 1 (a) and 1 (b), and points 2 and 4 of Annex III may be sold only in the nominal quantities shown in column I of Annex III.

3.2.2. Council Directive of 15 January 1980, 80/232/EEC

The main objective of Directive 80/232/EEC is to diminish differences between the legislation of Member States regarding the nominal quantity and volume ranges ([7]) allowed for some pre-packaged products. This is a follow-up to the preceding Directive 75/106/EEC, discussed above, and to the subsequent one 76/211/EEC of the 20.1.1976 ([8]).

Directive 80/232/EEC, unlike the previous Directive 75/106/EEC, regards some non-liquid product types, as well as products sold by weight or by volume packed in rigid containers of all types. The directive does not concern pre-packaged products exclusively for professional use. This directive aims at eliminating all obstacles, still present, to the free exchange of pre-packaged products, by approximating national legislation.

It grants particular importance to the consumer, who is safeguarded in those instances when too close indications of quantity of the different products are likely to create confusion (market transparency). These steps are better described in Table 2.

([7]) The term 'range' refers to the volumes and quantities in which products (whether liquid or non-liquid) can be pre-packaged.

([8]) The objective of Directive 76/211/EEC is the reconciliation of the legislative frameworks of Member States with regard to the pre-packaging by weight or volume of certain products. It is published in GU L 46/1 of the 26/02/1976, p.1.

Table 2

Council Directive 80/232/EEC on the approximation of the laws of the Member States relating to the ranges of nominal quantities and nominal capacities permitted for certain pre-packaged products		
Objectives	**Field of application**	**Contents**
1. TO ELIMINATE BARRIERS TO TRADE AND GRADUAL APPROXIMATION: remove all the barriers to trade in pre-packaged products and approximate provisions concerning the volume or weight which are different from one Member State to another. 2. TO PROTECT CONSUMERS: reducing as far as possible the numbers of quantities which are so close to each other that they risk confusing the consumers (market transparency).	Products put up in pre-packages marketed in constant nominal quantities: – equal to the values fixed by the packer; – expressed in mass/volume unity; – more than or equal to 5 g/5 ml or less than or equal to 10 kg / 10 l. and which are mentioned in the annexes hereto. The directive doesn't cover: • products provided for by the Directive 75/106/EEC; • pre-packaged products intended solely for professional use.	OPTIONAL VALUES: Member States cannot refuse, prohibit or restrict the placing on the market of pre-packages, which satisfies the requirements of the Directive for reasons concerning their nominal quantity. MANDATORY VALUES: Pre-packages listed in points 11 of Annex I may be sold only in the nominal quantities shown in the same item of Annex I (knitting yarns).

3.2.3. Products and type of ranges

These directives fix the volumes and quantities in which liquids and non-liquids (food stuffs and other) products are to be pre-packaged. With particular reference to the value ranges regarding the volume predetermination of some pre-packaged liquids, Annex III to the amended version of Directive 75/106/EEC sets them out as shown in Table 3.

Table 3

Annex III to Council Directive 75/106/EEC on the approximation of the laws of the Member States relating to the make-up by volume of certain pre-packaged liquids				
		Mandatory	**Optional**	**Type of range**
1.a	Wine of fresh grapes	16		Large
1.b	'Yellow' wines	1		Small
1.c	Other non-sparkling, fermented beverages		9	Medium
1.d	Vermouth, other flavoured fresh grapes wine		12	Large
2.a	Sparkling wine & in bottles with mushroom stoppers	9 (*)		Medium
2.b	Other fermented sparkling drinks		7	Medium
3.a	Beer made from malt		9	Medium
3.b	Acid beers, gueuze		3	Small
4	Spirits and other spirituous beverages	18		Large
5	Vinegar and substitutes of vinegar		6	Medium
6	Edible oils		8	Medium
7	Milk and milk-based beverages, by volume		6	Medium
8.a	Waters, spa waters and aerated waters		9	Medium
8.b	Lemonade, other non-alcoholic beverages		9	Medium
8.c	Beverages labelled as alcohol-free aperitifs		1	Small
9	Fruit juices and vegetable juices		9	Medium
Total		**44**	**88**	

(*) Excl.: for cans on aircraft, ships, trains and duty free.

From the above table it is clear that the products listed in points 1 (a), 1 (b)([9]), 2 (a) and 4 should be marketed in pre-packs with the nominal volume specified in column I of the abovementioned Annex III (mandatory).

According to what is provided for in Article 5, subparagraph 3, of Directive 75/106/EEC the former (the products as provided for in items 1 (a) and (b) of the Annex) after 31.12.1988 may be sold only in the nominal quantities shown in column I of the abovementioned Annex; while the latter, listed in point 2 of the Annex, after 31.12.1990 may be sold only in the nominal qualities shown in column I of the above Annex. The pre-packaged products as provided for in Annex III, Section 4, after the 31.12.1991 may, on the other hand, be sold in the nominal qualities shown in column I.

With reference to nominal quantities of the contents for certain pre-packaged products, the ranges are defined in Annex I of the modified Directive 80/232/EEC (see Table 4).

([9]) Fresh grapes wines, straw-coloured wines, bottled sparkling wines with mushroom shaped stoppers, except for cans used on air flights, sea crossings, trains and duty-free shops.

Table 4

Annex I to Council Directive 80/232/EEC on the approximation of the laws of the Member States relating to the ranges of nominal quantities and nominal capacities permitted for certain pre-packaged products				
		Mandatory	Optional	Type of range
1	**FOOD PRODUCTS SOLD BY WEIGHT**			
1.1	Butter, margarine		8	Medium
1.2	Fresh cheese except 'petites suisses'		7	Medium
1.3	Table and cooking salt		7	Medium
1.4	Impalpable sugar, red, brown, candy sugar		11	Large
1.5	**Cereal products excluding food for infants**			
	1.5.1 Cereal flour, groats and flakes		9	Medium
	1.5.2 Pasta products		10	Large
	1.5.3 Rice		7	Medium
	1.5.4 Ready-to-serve cereals and cereal flakes		7	Medium
1.6	Dried vegetables		9	Medium
1.7	Ground or unground roasted coffee, chicory, subst.		9	Medium
1.8	**Frozen products**			
	1.8.1 Fruit and vegetables, pre-cooked potatoes for chips		9	Medium
	1.8.2 Fish fillets and portions, breaded or not breaded		9	Medium
	1.8.3 Fish fingers		8	Medium
2	**FOODSTUFFS SOLD BY VOLUME**			
	Ice-cream of more than 250 ml		10	Large
3	DRY FOODS FOR DOGS AND CATS		13	Large
4	READY-TO-USE PAINTS AND VARNISHES		13	Large
5	SOLID OR POWERED GLUES AND ADHESIVES		10	Large
6	CLEANING PRODUCTS		15	Large
7	**COSMETICS: beauty and toilet preparations**			
7.1	Products for skin and oral hygiene		14	Large
7.2	Toothpaste		9	Medium
7.3	Hair care products (except dyes) and bath products		14	Large
7.4	Alcohol-based products		16	Large
7.5	Deodorants and personal-hygiene products		9	Medium
7.6	Talcum powders		8	Medium

8	**WASHING PRODUCTS**			
8.1	Solid toilet and household soap		11	Large
8.2	Soft soap		7	Medium
8.3	Soap in flakes, chips, etc.		7	Medium
8.4	Liquid washing, cleaning and auxiliary products		14	Large
8.5	Scouring powder		5	Small
8.6	Pre-wash and soaking products in powder form		6	Medium
9	**SOLVENTS**		11	Large
10	**LUBRICATING OILS**		10	Large
11	**KNITTING YARNS**	13		Large
Total		13	**312**	

Annex 1 to Directive 80/232/EEC set mandatory values only for one product category (i.e. knitting yarns).

3.3. Analysis of the case-law of the Court of Justice

An analysis of the Community legislation regarding pre-packaging sizes cannot be isolated from an analysis of the judgment in Case 120/78 of the Court of Justice of the European Communities (better known as *Cassis de Dijon*) and the more recent *Cidrerie Ruwet SA / Cidre Stassen SA* (C-3/99).

The Court of Justice, with the abovementioned decisions, establishes the principle that a Member State cannot prohibit the marketing of a pre-packaged product which is legally manufactured and marketed in another Member State, even if this product has a nominal volume not within the Community range. The practical consequence of these decisions is that if a Member State has ranges of sizes that are not valid in another State, they must be also considered valid in that other Member State. However, this is only a principle and not a law. So Member States aren't obliged to apply this rule of the Court of Justice but they are free to enact a law that makes this principle mandatory.

(a) Court judgment in Case120/78 (Cassis de Dijon).
The judgment in Case 120/78 (*Cassis de Dijon*) concerns the import of alcoholic drinks with regard to their alcoholic content. It doesn't deal with the ranges of sizes provided for pre-packaged products, but it can also be applied to them.

In particular, the Court of Justice gave an interpretation of Article 30 of the EEC Treaty (later modified as Article 28 of the EC Treaty). It had already forbidden Member States to impose, directly or indirectly, currently or potentially, restrictions to trade in the Common Market ([10]).

([10]) The Court had already ruled against Member States that impose quantitative restrictions on imports as provided for in Article 30 of the EEC Treaty which includes 'every commercial regulation of Member States enabling to restrict, directly or

This principle has now been extended to the import by one Member State of banned foodstuffs, whose production and trade is permitted in another Member State ([11]). It is therefore necessary to provide for a slow and gradual approximation of the single national legislative frameworks.

The term 'approximation', according to the expression in the Treaty, does not mean 'unification'. The idea is to promote the elimination of unreasonable differences and not the levelling off of all the national regulations which control matters affecting, directly or indirectly, currently or potentially, intra-Community trade.

Table 5

Case-law	**Subjects**		**Objectives**	**Effects**
Court judgment in Case 120/78 (*Cassis de Dijon*)	It deals with the import of alcoholic drinks with regard to their alcoholic content.	The Court ruled against Member States imposing measures of quantitative restriction on imports (every commercial regulation of Member States enabling them to restrict, directly or indirectly, currently or potentially, trade in the Common Market).	1. Gradual approximation: to provide for a slow and gradual approximation of the single national legislative frameworks, thus promoting the elimination of unreasonable differences, which could affect intra-community trade. 2. To eliminate barriers to trade: to permit the importation in a Member State of a banned foodstuff, whose production and trade is on the other hand permitted in another Member State. 3. To protect consumers: making mandatory the indication of the origin and the alcoholic content on the packaging of the products.	The practical consequence is mainly in the protection of national products with respect to their 'typical character' and 'genuineness'.

indirectly, currently or potentially, trade in the Common Market'. Judgment of 15.12.1976 in Case 4/76 published in *Body of Laws of the Court of Justice* 1976, p.1921.

([11]) The practical consequence of such a ban, as the Court asserts, consists mainly in the protection of national products with respect to their 'typical character' and 'genuineness'. The European Court of Justice strives to protect consumers, whereas it states that such protection 'is easy when one makes mandatory the indication of the origin and the alcoholic gradation on the packing of the products' or that protection is guaranteed as far as the label stuck onto the packet is 'visible and clearly legible', carrying the product's quality, in order to avoid risk of confusion with other similar products. This is also due because the label in itself, often ambiguous, is unable to protect the consumer from buying cheap surrogates.

(b) Judgment in Case C-3/99 (Cidrerie Ruwet SA / Cidre Stassen SA, Bulmer Ltd)
In the next and more recent judgment in Case C-3/99 (Cidrerie Ruwet SA / Cidre Stassen SA, HP Bulmer Ltd) the Court of Justice declared that the Council Directive 75/106/EEC of 19 December 1974 must be interpreted in the sense that the directive does not allow Member States to prohibit – through internal legislation – the marketing of pre-packaged products of a nominal volume, not within the range provided for by Annex III, column I, to the same directive.

This question has arisen in proceedings concerning the marketing (in Belgium), forbidden by a national legislation, of a certain product (cider) which satisfies some particular requirements (bottles having nominal volume of 0.33 l) and which is destined to the consumers.

In this circumstance, the Tribunal de commerce de Bruxelles decided to hold up proceedings and to refer the question to the Court of Justice for a preliminary ruling. It concerns the validity of Directive 75/106/EEC, in the current version, relating to Article 30 of the EC Treaty, with particular reference to the marketing of any pre-packaged products whose nominal volume is not included in those provided for in Annex III, column I, to the same directive, thus hindering the free circulation of goods.

Indeed, Directive 75/106/EEC was adopted in accordance with Article 100 of the EEC Treaty (now 94 of the EEC Treaty), for the purpose of approximating the legislative, prescriptive and administrative provisions with a direct influence on the realisation and the functioning of the Common Market. In fact, their objectives are the elimination of obstacles to the free circulation of pre-packaged liquid food products and the protection of the consumer from the risk of being misled.

Besides, according to settled case-law ([12]), Article 30 of the EEC Treaty is intended to prohibit any trading rules enacted by Member States which could hinder, directly or indirectly, intra-Community changes.

In the light of these preliminary considerations, it was concluded that, in the absence of a harmonisation of national legislative frameworks, Article 30 of the EEC Treaty (now Article 28 of the EC Treaty) must be interpreted as standing in the way of a Member State prohibiting the marketing of pre-packaged products with a nominal volume that is not within the Community range, but that is legally manufactured and marketed in another Member State. With the exception that such prohibition satisfies a connected mandatory requirement concerning consumer protection, being indiscriminately applicable to both national and imported products, that is necessary to satisfy such mandatory and proportionate request to the pursued objective, and that such objective cannot be reached with provisions that are less restrictive of intra-Community trade.

([12]) Besides the previously examined judgment in Case 120/78 *Cassis de Dijon*, reference is made here to a previous judgment of 11.7.1976, Case 8/74 *Dassonville*.

Table 6

Case-law of the Court of Justice (3/99)				
Case- law	**Subjects**	**Principles**	**Objectives**	**Effects**
Court judgment in Case C-3/99 (Cidrerie Ruwet SA / Cidre Stassen SA, Bulmer Ltd)	It concerns the marketing, in Belgium, of cider in bottles having a nominal volume of 0.33 l.	The Court gives an interpretation of the Council's Directive of 19.12.1974, 75/106/EEC in the sense that it does not allow Member States to prohibit – through national legislation – the marketing of pre-packaged products of a nominal volume not within the range provided for by Annex III, column I, to the same directive.	1. TO ELIMINATE BARRIERS TO TRADE: prohibiting any trading rules enacted by Member States which could hinder, directly or indirectly, intra-Community trade. 2. HARMONISATION: to approximate the legislative, prescriptive and administrative provisions which have a direct influence on trade. 3. TO PROTECT CONSUMERS: from the risk of being misled.	In the absence of a harmonisation of national legislative frameworks, we have to apply Article 28 of the EC Treaty.

3.4. General overview on regulation in the Member States

In this paragraph, an assessment takes place of the extent to which single Member States have carried out the two directives that are examined. As already stated before, both directives provide for value ranges concerning mass or volume of the product to be pre-packaged. Some of these values have been termed 'mandatory' in the same Community regulations ([13]), the rest – in the absence of a specific terminology – are to be considered as optional. In the first instance, the products may circulate within the Community's territory only if packed according to the quantity values provided for in the directive, whereas in the second case (optional quantity values) the States are left free to determine sizes.

However, applying both these directives has turned out to be quite complex. Not only in respect of the great variety of products which they encompass, but especially in view of the fact that Member States have at any rate reserved the right to fix national ranges, given the non-mandatory nature of the directives. An assessment of assimilation procedures by single States appears therefore relevant, since all the quantity values provided for by the Directives, except for those indicated above, could be assimilated by Member States as mandatory or as optional.

In Annex 1 to this report an overview is presented of legislation concerning pre-packaging sizes in all Member States. A summary is presented in Table 7.

([13]) Please refer to items 1.a, 1b, 2b, 4 of attached document III of Directive 75/106/EEC and item 11 of attached document I of Directive 80/232/EEC.

Table 7

Overview of various legislation varieties		
	Products	
	Liquid foodstuffs	**Non-liquid foodstuffs**
Mandatory values: prescribed by the directives	Wine Yellow wine Sparkling wine & in bottles with mushroom stoppers Spirits & other spirituous beverages	Knitting Yarns
Optional values for the directive and optional values for the majority of Member States.	Other non sparkling, fermented beverages	Cereals flours, groats and flakes ([14]) Frozen products: • fruit & vegetables, pre-cooked potatoes([14]); • fish fillets & portions ([14]) • Fish fingers([14]) Ice cream of more than 250 ml ([14])
Optional values for the directive and mandatory for the majority of Member States.	Beer Vermouth, other flavoured wine fresh grapes Other fermented sparkling drinks Acid beer, gauze Vinegar & substitutes for vinegar Edible oils Milk and milk based beverages, by volume Waters, spa waters & aerated waters Lemonade, other non-alcoholic beverages Beverages labelled as alcohol-free aperitifs Fruit juices & vegetable juices	Butter & margarine Fresh cheese except *petits suisses* Table & cooking salt Impalpable sugar, red, brown, candy sugar Pasta products Rice Ready to serve cereals & cereals flakes Dried vegetables Ground or unground roasted coffee ([15]), chicory Dry food for dogs and cats Ready to use paints and varnishes Solid or powered glues and adhesives Cleaning products Products for skin and oral hygiene Toothpaste Hair care Products (except dyes) and bath products Alcohol-based products Deodorants and personal-hygiene products Talcum powders Solid toilet and household soap Soft soap Soap in flakes, chips, etc. Liquid washing, cleaning and auxiliary products Scouring powder Pre-wash and soaking products in powder form Solvents Lubricating oil
Not included in the annexes to directives		Yoghurt

([14]) The item includes States without regulation.
([15]) Excluding soluble coffee.

3.4.1. Conclusions

In general, four types of regulatory strategies are distinguishable, the values adopted at Community level and at national level being the criterion on which the distinction is made. Thus we have:

1. mandatory values prescribed by the directives;
2. optional values at Community level assimilated as optional at national level;
3. optional values at Community level assimilated as mandatory at national level;
4. values not included in the directive's annexes.

3.5. Alternative regulatory strategies

3.5.1. Introduction

This paragraph focuses on the regulation of pre-packaging sizes in Canada and the United States. This is done in order to be able to compare such legislation with its current European counterpart and to identify the existence of innovative regulatory strategies that could also be applied in Europe.

The analysis of the legislation in the United States of America and Canada on pre-packaging products shows that in those countries there aren't fixed ranges of sizes. In fact, except for some products (such as: wine, peanut butter, glucose syrup or refined sugar syrup in Canada; alcohol in the United States), manufacturers are free to choose the sizes of the containers in which they could package the products. However, such containers may not be formed (filled or designed) in such a way as to mislead consumers.

Primarily, one must provide a general overview of the legislative systems of these countries, by analysing their respective constitutional charters.

3.5.2. The federal system in Canada

Canada's Constitution establishes a basic structure for the legislative and juridical systems by defining the nature of the federal and provincial governments, the way these governments are elected and the authority assigned to each one of them ([16]). More precisely, legislative power is shared between Parliament ([17]) (Federal Government) and the various provincial legislative councils ([18]).

Parliament has authority in all matters regarding the entire nation, such as industry and commerce, national defence, immigration and criminal law. The provincial governments

([15]) One of the limits highlighted by the Constitution is the one about laws being emanated or changed only through statutes approved by parliament or by provincial or territorial legislature.

([17]) Any member of parliament or a legislative board may propose a new law, but most new laws are put forward by the government in power. Any proposed law must be presented for consideration by all members, in order to study and debate it. The proposal becomes legal only if it is approved by the majority. Federal laws must be approved by both Houses of Parliament – the House of Commons and the Senate – and receive royal approval.

([18]) Within the limits set out by the Constitution, laws can be made or changed by means of written statutes enacted by Parliament or provincial or territorial legislative assemblies. Statute laws automatically take the place of any conflicting unwritten, or common law, precedents dealing with the same matters.

are concerned with education, private property, the administration of justice, hospitals, registry offices and all matters of a local nature or concerning the rights of individual persons.

Regulations at council level vary from one province to another and are based on a 'common law'([19]) system, typical of nine provinces of a total of 10 in Canada ([20]). Canada is however also governed by supranational laws, concerning matters that require the intervention and cooperation of the various local governments ([21]).

3.5.3. The federal system in the United States

The United States' Constitution distinguishes between federal and state public authority as well. The central (federal) authority is subdivided into three coordinated but independent sections: the executive, the legislative ([22]) and the judiciary. As far as the legislative authority is concerned, a certain number of issues ([23]) fall within the competence of the legislative board of the Federal Congress, among which the most notable are those forming part of the 'Commerce Clause' ([24]), such as the issue of bankruptcy, the right of enterprise and other matters (maritime and admiralty) ([25]).

However, the Federal Constitution concerns only the federal system and not the single states, but the tenth amendment specifies that 'all powers which are not assigned to the federal system remain in the hands of the single states and of the people' (Residual Powers Clause). It means that the federal legislative authority deals with single issues specifically listed by the Constitution whereas all other matters are assigned to the legislative authority of the states.

The single states may intervene even in matters that are assigned to the Federal authority when certain issues are not duly regulated by federal legislation ([26]). In particular, as far as consumer rights protection is concerned, Congress has adopted the system of appointing federal agencies with specific duties and powers to issue 'regulations'.

([19]) Common law is a system based on judgements made by courts, which become 'precedents' that establish the underlying principles of the law.

([20]) The law in Quebec is based on a written code (*Code civil*), which contains general principles and rules for different types of situations. When a case is considered under civil law, the judge looks first to this written code for guidance and then to the precedents set by earlier decisions.

([21]) Some examples are transboundary pollution, fishing of straddling or migratory stocks, international money laundering and trade issues.

([22]) In particular, as far as what we are here concerned with, Article 1 of the United States' Constitution concedes legislative authority to the States' Congress composed of the Senate and the House of Representatives whose members are elected on a 'winner takes it all' basis.

([23]) Federal authority deals with foreign affairs, defence, internal and external trade and the right of imposing and exacting federal taxes, the issue of currency and the development and administration of public debt. All powers not expressly assigned to the federal authority fall within the competence of the states forming part of the federation.

([24]) According to this clause 'the Congress shall have the power (...) to regulate commerce with foreign nations and among the several states and with the Indian tribe' (Section 8, paragraph 4 of the Federal Constitution of the United States).

([25]) The so called 'implied powers clause': in other words the authority to 'implement all the necessary and proper laws for the wielding of power (…) with which the Constitution invests the United States Government or its ministries.

([26]) It could therefore happen that Congress enacts laws which establish certain rights, omitted, however, in matters of regulation of the relative remedies. In such cases, the single states are empowered to establish the remedies required to protect rights instituted by Congress.

This was made possible as a result of the extensive interpretation of the Federal Supreme Court of the so called 'Commerce Clause', which means that all matters regarding the production and exchange of goods and services with potential inter-state range, fall under federal authority. Consequently extending single states' regulatory powers, through deregulation ([27]).

As far as pre-packaging is concerned, the principal executive agency that enforces US laws regulating on most pre-packaged food is the Food and Drug Administration (FDA). The FDA's prime mission is to enforce food laws enacted by the US Congress to protect consumers' health, safety, and pocketbook. The main law enforced by the FDA is the Federal Food, Drug, and Cosmetic Act of 1938 (FDCA) ([28]). Congress significantly amended the FDCA in 1990 with the Nutrition Labelling and Education Act. The FDA has enacted extensive regulations that interpret and enforce the FDCA ([29]).

3.5.4. Screening of regulations concerning pre-packaging sizes in Canada

The most important Canadian laws concerning pre-packaging sizes are the 'Consumer Packaging and Labelling Act' and 'Consumer Packaging and Labelling Regulations'. These acts provide detailed regulations on various types of goods ([30]). They are mainly documents with a federal context falling into the legislative competence of the parliament (*Traffic et commerce,* Article 91.2). However they provide for the right of the Governor in Council to issue 'regulations' regarding the labelling on containers or pre-packed products.

The first part of these documents contains the definitions (i.e. 'interpretations') of the most commonly used terms, such as, for example, 'pre-packaged product', which means any product packed in a container ([31]), in which it is usually sold or used or bought by consumers, without being packed again (Section 2 Act)([32]).

([27]) Federal legislation, whether direct or indirect, concerning the right (editor's note public) of management constitutes therefore today an interminable *corpus*, the greater part of matters recognised as 'private rights' remaining within the competence of the states.

([28]) Title 21 of the United States Code (USC). The FDA also enforces, among other things, the Fair Packaging and Labelling Act. 15 USC § 1451 to 1461.

([29]) Title 21 of the United States Code of Federal Regulations (CFR).

([30]) These documents furnish detailed provisions about pre-packaged non-food consumer products and concern all products, exempting drugs and medical equipment; products for commercial, industrial or institutional use only; products for export only; products sold only to a duty-free store; pre-packaged textile articles; replacement parts for consumer durables (cars, appliances) if not displayed to consumer; certain artists supplies. Subsection 4 (1) of the Regulations establishes also that pre-packaged products that are subject to the labelling requirements of the *Feeds Ac*t, *Fertilisers A*ct, *Pest Control Products Act* or the *Seeds Act* are exempt from the detailed labelling requirements (Sections 4, 5, 6, 8 and 10) of the *Consumer Packaging and Labelling Act*.

([31]) A 'container' is a package or a wrapper in which a product is offered for sale, but doesn't include package liners or shipping containers or any outer wrapping or box that is not customarily displayed to the consumer (Section 2 Act).

([32]) Such a definition is clearly very close to the one provided for by Directive 75/106/EEC in which, as already seen, the term 'pre-packaged' refers to a combination of product and container readily made for the buyer in such a way that the quantity of product contained has a previously fixed price which cannot be modified without opening the packaging or subjecting it to evident modifications.

However, the Canadian Act does not contain detailed provisions on pre-packaging ranges of sizes; but it determines the aspect of the label thus protecting consumers against any risks of confusion.

In particular, Section 7 of the Canadian Act forbids false and deceitful labelling of pre-packaged products and provides for that all information shown on the packed product, whether expressed in symbols or words, is neither false nor misleading.

Section 10 of the Act concerns the regulation of compulsory information that a label must display:

- product identity ([33]);
- product net quantity;
- dealer's name and principal place of business ([34]).

The procedures for indications of net quantities of single pre-packaged products (Subsection 4 of the Act) requires a 'net quantity' to be printed in bold characters:

- in metric units of volume, when the product is liquid, gas or a viscous ([35]) substance; or
- in metric units of weight, when the product is solid; or
- in numerical count when the product is sold in single units ([36]) .
  In the case of products sold in single units, with only one single item being boxed, the net quantity is considered as already expressed by the description 'product identity'. With such an option, on the product 'display panel' the 'product identity' is shown using the minimum 'type height' specified for indications of net quantities (e.g. camera).

Some exceptions to these general rules are provided for by the Regulations, such as:

- the net quantity of aerosols is shown by weight (propellant and ingredients) (Section 22(1) of the Regulations) (e.g. aerosol);
- the net quantity of certain twin-ply products (i.e. wrapping paper, toilet tissue, etc.) is shown by specifying the number of rolls or sheets present in the pack, or by indicating their length or width, area or number of sheets when applicable (Subsections 23(1) and 23(2) of the regulations) (e.g. gift wrap).

In case of pre-packed products manufactured entirely outside Canada, the following instructions must be observed:

- the name and address of the Canadian retailer preceded by the words 'imported by/importé par' or 'imported for/importé pour'; or

([33]) That is the identity of the pre-packaged product in terms of its common or generic name or in terms of its function. It must be shown in English and French. In some cases a product identity declaration is bilingual in and of itself, such as 'cologne' or 'serviettes' (Subsection 6 (2) of the Regulations).
([34]) That is the identity and principal place of business of the person by or from whom the pre-packaged product was manufactured or produced for resale. The place of origin and name of manufacturer or dealer must also be shown on the front of the pre-packaged product both in English and French. Such an indication may be anywhere on the outside of the packaging, except for the upper side, provided that it is clearly legible.
([35]) One example of a liquid or viscous product: washing-up liquid or hand creams.
([36]) However, in the case of accepted commercial practice complying with the procedures of indications of net quantities of pre-packaged products, the latter may still be expressed according to such practice.

- the place of origin immediately adjacent to the name or address of the Canadian retailer; or
- the name or address of the retailer outside Canada.

However, if the imported product, even when in bulk, is pre-packaged and labelled inside Canada, the labelling terms ([37]) detailed in the Canadian Regulations must be fulfilled.

3.5.5. Standard package sizes (Section 36 of the Regulations)

Finally, the regulations prescribe the standard measures of containers of particular products such as: wine, peanut butter, glucose syrup and refined sugar syrup. With particular reference to wine, Section 36 of the regulations prescribes that it may be sold in containers whose net product quantity corresponds to 50, 100, 200, 250, 375, 500 or 750 ml or 1, 1.5, 2, 3 or 4 litres. Peanut butter may be sold in containers whose net product quantity corresponds to 250, 375, 500 or 750 g or to 1, 1.5 or 2 kg. The glucose syrup container or the refined sugar syrup container must correspond to product net quantities of 125, 250, 375, 500 or 750 ml, or 1, 1.5 or 2 litres or more, if the container's size corresponds to product net quantities in multiples of a litre.

Table 8

Canada: Packaging and Labelling Act and Regulations		
Objectives	**Field of application**	**Contents**
1. TO PROTECT CONSUMERS: against misleading information concerning the contents of a pre-packaged product.	• Federal application. • Packages containing foodstuffs product.	These acts provide for detailed regulations on pre-packaging sizes and labels with reference to various types of goods. It provides for that only some pre-packaged products must have mandatory sizes, as shown in the table below.

Table 9

Standard pre-packaging sizes in Canada (Section 36 of the regulations)			
		Mandatory	**Optional**
Type of product			
1	Wine	12	
2	Peanut butter	7	
3	Glucose syrup or refined sugar syrup	8 or more (*)	

(*) When the container's size corresponds to net quantities of a product in multiples of a litre.

([37]) In case the label, directly or indirectly, refers to the place of production or printing of the label itself, or of the container and not to the place of production and/or origin of the product, such an indication must be followed by additional information showing that the indicated place of production refers exclusively to the label and to the container.

3.5.6. Screening of regulations concerning pre-packaging sizes in the United States

The principal goal of US packaged food regulation is to protect the health and economic welfare of consumers. US law protects the health of consumers by mandating, among other things, food quality requirements. The Food and Drug Administration (FDA) enforces the principal federal law regulated packaged food. The FDA law protects consumers' economic welfare by requiring labels on packed food describing accurately its contents.

Except for alcohol, the United States does not require that food be packaged in certain size containers. Alcohol may be sold only in one of the approved standard-sized containers ([38]). Manufacturers are otherwise free to choose the size of the containers in which they package any other food. However, such containers may not be formed in such a way as to mislead consumers, and they must bear a disclosure as to the weight or volume and ingredients of the contents. Thus, US packaged food regulations protect consumers by allowing them to make informed decisions.

US law regulates food containers principally by requiring that they be made from materials that will not change food contents in such a way as to harm consumers. Additionally, for many foods, US law requires that whatever the size of the container, the manufacturer must fill a set (large) percentage of the container's volume. These latter rules are called 'fill-of-container' standards.

Federal food laws generally pre-empt non-identical state laws in order to foster as much uniformity of food standards and food law enforcement. Because federal laws leave various areas of food practices unregulated, however, states are free to pass their own laws in these areas. States may also enact their own versions of federal food laws as long as the state laws are identical to the federal laws. Enacting such laws allows states to enforce essentially the same food rules as the federal government, though states may engage in such enforcement in their own courts (as opposed to enforcing federal rules in federal courts).

3.5.7. US law in general

The Food, Drug and Cosmetic Act is, in essence, a labelling law, in that its prohibitions and sanctions apply only where there is 'misbranding' and/or 'adulteration'. The FDCA does not absolutely or unconditionally prohibit the sale of any food, even in commerce that Congress may constitutionally regulate. Rather, the reach of the FDCA is only with respect to shipments that are 'misbranded' and/or 'adulterated'.

The FDA has jurisdiction not only over labelling in the narrow sense, i.e., over labels attached to containers and outer and inner packaging, but also over package inserts, advertising, and external accompanying descriptive literature. The FDA has jurisdiction over both the form and substance of labelling, including content (i.e., ingredients), directions for use, and claims of efficacy. If a food does not comply with the requirements of the FDCA, the FDA may seize it or penalise the manufacturer ([39]).

([38]) The US Department of the Treasury through its Bureau of Alcohol, Tobacco, and Firearms sets and enforces these alcohol container standards.
([39]) 21 USC §§ 333-334.

Alcoholic beverages are subject to the FDCA's adulteration provisions ([40]). The FDA does not, however, have the power to regulate labelling and container standards for alcohol. The Federal Alcohol Administration Act ([41]) gave the US Department of the Treasury exclusive jurisdiction over alcohol labelling and container standards.

3.5.8. The FDCA's protections

The FDCA's protections can be divided generally into health safeguards and economic safeguards. Examples of health safeguards include mandating that a food is illegal (adulterated) if it bears or contains an added poisonous or deleterious (harmful) substance which may render it injurious to health (21 USC § 402(a)(1)), mandating that a food is illegal if it bears or contains a naturally occurring poisonous or deleterious substance which ordinarily renders it injurious to health (21 USC § 402(a)(1)), and requiring that food additives (Section 201(s)) must be determined to be safe by FDA before they may be used in a food, or become a part of a food as a result of processing, packaging, transporting, or holding the food (21 USC § 409).

The FDCA's health safeguards also require that food containers must be free from any poisonous or deleterious substance which may cause the contents to be injurious to health (21 USC § 402(a)(6)). Some packaging materials, for example plastic or vinyl containers, may be 'food additives' subject to regulations (21 USC § 409).

Examples of the FDCA's economic safeguards include the requirement that damage or inferiority in food, must not be concealed in any manner (21 USC § 40). Nor may any substance be added to, mixed, or packed with a food to increase its bulk or weight, reduce its quality or strength, or make it appear better or of greater value than it is (21 USC § 403(b)(4)). For example, yellow colouring used to make a food appear to contain more eggs than it actually contains; food labels or labelling (circulars, etc.) must not be false or misleading in any particular way (21 USC § 403(a)(1)). Labelling is misleading not only if it contains false or misleading statements but also if it fails to reveal material facts (21 USC § 201(n)). A substance recognised as being a valuable constituent of a food must not be omitted or abstracted, in whole or in part, nor may any substance be substituted for the food in whole or in part (21 USC § 402(b)(1) and (2)). For example, an article labelled as 'milk' or 'whole milk' from which part of the butterfat has been skimmed.

The FDCA's economic safeguards also require that food containers must not be so made, formed, or filled as to be misleading (21 USC § 403 (d)). For example, a food for which a standard of fill-of-container has been prescribed (21 USC § 401) must comply with the fill requirements, and if the fill falls below that which is specified, its label must bear a statement that it falls below such standard (21 USC § 403(h)(2)).

3.5.9. Food standards

Food standards are a necessity to both consumers and the food industry. They maintain the general quality of a large part of the national food supply and prevent economic

([40]) Brown-Forman Distillers Corp. v Mathews, 435 F. Supp. 5, 7 (W.D. Ky. 1976).
([41]) 27 USC § 201 to 219a.

fraud. Without standards, different foods could have the same names or the same foods could have different names. Both situations would be confusing and misleading to consumers and create unfair competition.

Section 401 of the FDCA required the FDA to promulgate regulations fixing and establishing for any food, under its common or usual name so far as practicable, a reasonable definition and standard of identity, a reasonable standard of quality, and/or reasonable standards of fill-of-container.

'Standards of identity' define what a given food product is, its name, and the ingredients that must be used, or may be used in the manufacture of the food (21 CFR § 131 to 169).

'Standards of quality' are minimum standards only and establish specifications for food quality requirements (21 CFR § 130.14). 'Fill-of-container' standards define how full the container must be and how this is measured (21 CFR § 130.12). As noted, fill-of-container standards require that food containers must not be so made, formed, or filled as to be misleading. A packaged food must disclose on its labelling the extent to which it meets these standards.

For example, the FDA has established fill-of-container standards for certain fish products, mandating minimum net weights or minimum drained weights. Fill-of-container standards for canned fruit and vegetables may be grouped as follows.

- Those that require the maximum practicable quantity of the solid food that can be sealed in the container and processed by heat without crushing or breaking such component (limited to canned peaches, pears, apricots, and cherries).
- Those requiring a minimum quantity of the solid food in the container after processing.

The quantity is commonly expressed either as a minimum drained weight for a given container size or as a percentage of the water capacity of the container.

- Those requiring that the food, including both solid and liquid packing medium, shall occupy not less than 90 % of the total capacity of the container.
- Those requiring both a minimum drained weight and the 90 % minimum fill.
- Those requiring a minimum volume of the solid component irrespective of the quantity of liquid (canned green peas and canned field peas).

FDA fills-of-container standards are extensive and address a large number of foods([42]). As noted, fill-of-container standards for packaged foods do not require any particular size containers. Rather, these rules set forth only the required percentage of the volume of a container – whatever its size – that a manufacturer must fill with food.

([42]) See e.g. 21, CFR145-164.

3.5.10. Alcohol regulation by the Department of the Treasury

The Federal Alcohol Administration Act ([43]) (FAAA) authorises the Secretary of the Treasury to regulate the bottle sizes for wine, distilled spirits, and malt beverages. The Treasury Department in turn delegated authority to regulate alcoholic beverages to its Bureau of Alcohol, Tobacco, and Firearms (BATF). The Internal Revenue Code of 1986 ([44]) also authorises regulations regarding the kind and size of containers for distilled spirits for excise tax purposes. Distilled spirits regulations allow for several standards of fill ([45]). Wine regulations also authorise several standards of fill ([46]). Malt beverage regulations do not currently prescribe standards of fill, but do address net content statements on labels ([47]).

The purpose of the standards of fill provisions is to prevent a proliferation of bottle sizes and shapes that would inevitably result in consumer confusion and deception with regard to the quantity and net contents of the alcohol beverage package.

The uniformity in bottle sizes required by these standards also facilitates the proper calculation of federal excise tax ([48]).

While the FAAA highly regulates alcohol, the Act leaves states broad latitude to enact their own laws regulating trade, advertising, sale, use and other matters involving alcohol ([49]). Nonetheless, the FAAA explicitly prohibits states from requiring any statement on alcoholic beverage containers other than that provided for in the FAAA ([50]). The FAAA also pre-empts state laws regarding specific container sizes and label requirements for wine and distilled alcohol ([51]).

Specifically, in 27 CFR 4.71 through 4.73, the BATF mandates standards for wine containers and their fill, and 27 CFR 5.45 through 5.47a mandate similar standards for distilled alcohol. Annex 2 to this report contains more detailed information concerning standard sizes regulation.

([43]) 27 USC § 205(e).
([44]) 26 USC § 5301.
([45]) 27 CFR § 5.47a.
([46]) 27 CFR § 4.73.
([47]) 27 CFR § 7.27.
([48]) Notice No 872, notice of proposed rule-making, prohibit certain alcohol beverage containers and standards of fill for distilled spirits and wine, Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms (1998).
([49]) See e.g. 27 USC § 205: federal prohibition on printing alcoholic content of malt beverages on containers unless required by state law.
([50]) 27 USC § 216.
([51]) See e.g. 27 CFR 5.45.

Table 10

US: Federal Food, Drug and Cosmetic Act		
Objectives	**Field of application**	**Contents**
1. TO PROTECT THE HEALTH OF CONSUMERS: by mandating food quality requirements and by allowing them to make informed decisions. 2. TO PROTECT THE ECONOMIC WELFARE OF THE CONSUMERS: by requiring labels on packed food describing accurately its contents.	The Federal Food, Drug and Cosmetic Act is the principal federal law regulated packaged food. The FDCA doesn't cover: alcoholic beverages (except for the adulteration provisions).	• The United States does not require that food be packaged in certain size containers. • Alcohol is the only food for which there are mandatory, nation-wide container size standards.

Table 11

US: Federal Alcoholic Administration Act		
Objectives	**Field of application**	**Contents**
1) TO PROTECT CONSUMERS: by preventing the proliferation of bottle sizes and shapes. 2) TO FACILITATE CALCULATION OF TAXES.	The FAAA is the principal federal law regulating alcoholic beverages (except for the adulteration provisions).	The Federal Alcohol Administration Act ([52]) (FAAA) authorises the Secretary of the Treasury to regulate the bottle sizes for wine, distilled spirits, and malt beverage as shown in the table below (except for malt beverage for which the Act addresses only net contents statements on labels).

Table 12

Standards of fill provided for alcoholic beverages in the United States (27 CFR)			
		Mandatory	**Optional**
Alcoholic beverages			
1	Distilled spirits	12	
2	Wine	9 or more (*)	

(*) Sizes larger than 3 litres. Wine may be bottled or packed in containers of 4 litres or larger if the containers are filled and labelled in quantities of even litres (4 litres, 5 litres, 6 litres, etc.).

([51]) 27 USC § 205(e).

3.6. Current regulatory strategies

In this paragraph current regulatory strategies are summarised. This summary is based on an analysis of existing European, American and Canadian legislation.

3.6.1. Strategy A: mandatory European legislation with producer freedom
This strategy entails pre-packaging legislation within the EU that provides for a large range of mandatory sizes. As a result, for each country within the EU and for each company, the same mandatory ranges of sizes exist. This means that in practise, almost any thinkable size is allowed. Moreover, there is no national legislation that forbids some of the sizes that the EU allows. This is essentially the current situation for wines of fresh grapes.

This is summarised in Table 13.

Table 13

Strategy A: mandatory European legislation with producer freedom					
Legislator	**Legal framework**	**Potential objectives**	**Nature**	**Ranges of sizes**	**Products**
EC	Directive 75/106/EEC	(a) to harmonise conditions for the sales presentation of products; (b) to enable consumers to be correctly informed (c) to reduce the number of volumes of contents that are too close	Mandatory	Large (16)	Wines of fresh grapes
EC	Directive 80/232/EEC	(a) to approximate the provisions concerning the volume or the weight of products; (b) to eliminate barriers to trade (c) to protect consumers	Mandatory	Large (13)	Knitting yarns

3.6.2. Strategy B: Mandatory European legislation without freedom for producers
This strategy aims to harmonise the legislation concerning pre-packaging ranges within the EU and as a result, all ranges, set by the EU, are mandatory. However, in this option, the mandatory ranges are very small in order to protect consumers against confusion. This strategy can be compared to the current situation for yellow wines that are subject to a very small range indeed. In general, producers of these products have only few mandatory ranges of size.

This is summarised in Table 14.

Table 14

Strategy B: Mandatory European legislation without freedom for producers					
Legislator	**Legal framework**	**Potential objectives**	**Nature**	**Ranges of sizes**	**Products**
EC	Directive 75/106/EEC	(a) to harmonise conditions for the sales presentation of products; (b) to enable consumers to be correctly informed (c) to reduce the number of volumes of contents that are too close	Mandatory	Small (1)	Yellow wines

3.6.3. Strategy C: Optional European legislation together with mandatory non-harmonised sizes

Although this scenario contradicts EU policy concerning harmonisation of pre-packaging, in practice, this strategy still exists. This scenario is based on optional ranges set by the EU, and mandatory legislation on a national level.

As a result, all existing ranges, in each EU State, could be different from the ones provided for in the others.

Based on the *Cassis de Dijon* and the mutual recognition principle, this strategy should not pose any trade barriers. Still in practise, as we will see in the case of soft drinks in Chapter 5, this strategy may still cause de facto trade barriers. Producers do not always find it feasible to go to court and to enforce the permission to sell their products in EU countries with mandatory ranges differing from the one in their own country. This is essentially the current situation for beer and soft drinks.

This is summarised in Table 15.

Table 15

Strategy C: Optional European legislation and mandatory non-harmonised national sizes				
Legislator	**Legal framework**	**Potential objectives**	**Nature**	**Ranges of sizes**
National	Various national legislation	(a) to protect consumer (b) to protect national interests (c) to guarantee the genuineness of local products (see case-law C-3/99)	Mandatory	Relevant (the larger the ranges, the less trade barriers)

3.6.4. Strategy D: Mandatory national ranges with 'mutual recognition' (Cassis de Dijon)

This strategy aims to eliminate the barriers for intra-Community trade or between States who are parties to international treaties. The relevant point is not that national legislation is mandatory, but that nations accept any package size that is allowed in another EU country (*Cassis de Dijon*). The result is that in practice every product manufactured in a EU Member State can be marketed everywhere in the European Union. This situation can be compared to the current situation in Spain. Spanish legislation allows the introduction into the Spanish market of pre-packaged products in sizes other than those provided for in the national legislation, if those products come from EU Member States and from States which are parties to the European Free Trade Association and to the Treaty concerning European Economic Space.

This is summarised in Table 16.

Table 16

Strategy D: Mandatory national ranges with mutual recognition (*Cassis de Dijon*)					
Legislator	**Legal framework**	**Potential objectives**	**Nature**	**Ranges of sizes**	**Products**
National legislation	E.g.: Real Decreto 1472/1989 of Spain (Disposion addicional cuarta)	(a) to harmonise national legislation (b) to eliminate barriers to trade	Mandatory	Not relevant	All products that are legislated

3.6.5. Strategy E: Federal mandatory legislation in Canada and the United States (*).

This strategy concerns legislation in Canada and the United States, without regulation (liberalisation of all existing ranges). In fact, only the range of sizes of some specific products are mandatory thus protecting consumers. Of 11 other products, the range of sizes is free for producers to choose. Transferred to the European context this would mean that, in practise, any conceivable size is allowed on a 'federal' level, even if on a national level there could be legislation that forbids some of the sizes that the European Union allows. This is essentially the current situation in Canada and the United States, whose legislation can propose some alternative regulatory options that could possibly be adopted.

This is summarised in Table 17.

Table 17

Strategy E: Federal mandatory legislation in Canada and the United States					
Legislator	**Legal framework**	**Objectives**	**Nature**	**Ranges of size**	**Products**
Federal legislation	Packaging and Labelling Act	(a) to protect consumers against misleading information	Mandatory	Small	Only some products (such as peanut butter, wine, glucose syrup and sugar refined syrup)
Federal legislation	Federal Food, Drug and Cosmetic Act	(b) to protect the health and the economic welfare of consumers	Not relevant	Free	All products that are legislated
Federal legislation	Federal Alcoholic Administration Act	(c) to protect consumers (d) to facilitate calculation of taxes	Mandatory	Large	Alcoholic beverages

(*) The federal system in the EU is NOT equal to the federal system in the United States. In the United States the federal system is stronger: no exemptions are possible at state level.

3.7. Screening of potential regulatory scenarios

Several future regulatory scenarios are conceivable as the variety of strategies described in paragraph 3.6 suggest. In general one choice is leading: either harmonise EU legislation or do not. In case one follows the non-harmonising scenario, three options are identified: liberalisation (no legal regulation about sizes at all), standardisation and a mixture of mandatory legislation for some products and standardisation for the rest (see Figure 1).

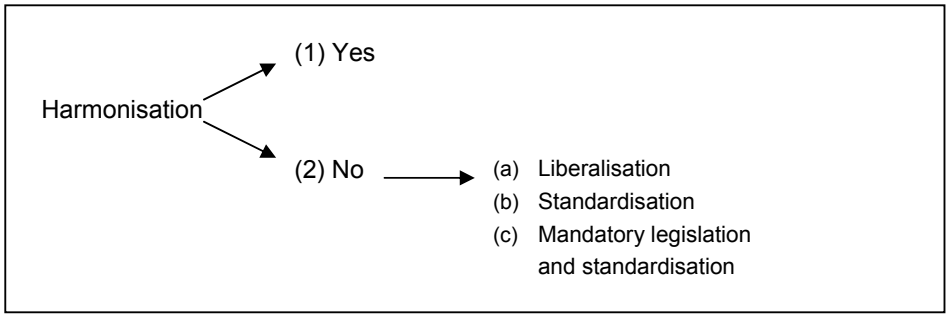

Figure 1. Regulatory scenarios

The first scenario (1) may be felt to best ensure consumer protection against the risks of confusion. Harmonisation could be realised by gradually approximating national legislation, in particular mandatory ranges.

The second scenario (2a) would leave freedom to producers to choose whatever kind of size for their pre-packed products. An interesting example is offered by the legislation of the United States and Canada (except for alcoholic beverages).

The third scenario (2b) comprises the use of standards. This could be realised by industrial voluntary agreements, made among recognised international organisations, so to create standard sizes.

Considering the actual situation both in Europe and outside Europe (United States and Canada), one could think of keeping mandatory sizes for some particular products, more marketed, and for the rest of the products apply standards or liberalise the ranges (2c).

3.7.1. Scenario 1: Harmonisation

As will be described in the next chapter, the responsibilities behind pre-packaging are:

- to guarantee the quality of the product during transportation from the factory to the retailer and from the retailer to the consumer (industrial pre-packaging);
- to inform the consumer about the product contents (consumer pre-packaging).

Informing the consumer may be guaranteed by harmonising the conditions of product launching, particularly with respect to metrological systems, labelling and product

nominal quantities. It would be possible to do this by providing for a gradual approximation of each single national legislation concerned, setting up regulatory terms at Community level to be directly implemented inside each Member State.

In this respect, the decision of the Court of Justice in the case known as *Cassis de Dijon*, that suggests the need of providing for a 'careful and gradual' approximation of each single national legislation, before any possible economic harm is caused, is a case in point. And the term 'approximation', as the Treatise points out, is not to be taken to mean 'unification', but rather the elimination of unreasonable differences.

All this could become possible first of all by including in the same set of regulations the metrological requisites currently advocated by European Directives 75/106/EEC and 80/232/EEC, retaining, if necessary, the Community ranges for capacity of containers termed as 'mandatory' by present legislation and declaring compulsory all those that are provided for as optional.

At a later stage, one could reduce, little by little, all too narrowly interspaced quantities, in other words, standardise the different typical quantities of every single packed product. Research studies carried out on a European scale([53]) have shown that a majority of customers is confused by the differences in volumes and all the information provided on the various types of packaging. As a result, they cannot decide which product is worth their money when comparing quality/quantity to price ([54]).

The final purpose would therefore be the formulation of a new legislation as a directly applicable measure in each single Member State in order to achieve greater uniformity.

Table 18

Scenario (1) Harmonisation					
Legislator	**Legal framework**	**Objectives**	**Nature**	**Ranges of sizes**	**Products**
EC	Relevant	(a) to harmonise conditions for the sales presentation of products; (b) to enable consumers to be correctly informed (c) to reduce the number of volumes of contents that are too close	Mandatory	Not relevant	All

([53]) 'Why consumers under-use food quantity indicators", Study by Manchester School of Management, UMIST: Published in the 'International Review of Retail, Distribution and Consumer Research', 11, 2 April 2001.
([54]) It should not be at all surprising that more than 70 % of interviewed customers have declared that they would rather buy packaged products in standard quantities, rather than in different quantity ranges and that around 47 % are convinced that the packet dimensions reflect the actual quantities contained (which means that in the case of equal content products packed in containers of various dimensions – like for instance certain detergent re-fills – customers are inclined to erroneously believe that they contain different quantities).

3.7.2. Scenario 2: No harmonisation

(a) Liberalisation: no legal regulation about sizes

An alternative solution, as practised in the United States and Canada, would be the provision of a single basic legislation at supernational and Community level. In that case, only guidelines and regulatory basic principles regarding pre-packages (packaging procedures, metrological control, etc.) are set down aiming to ensure that the customers' right to quality is still safeguarded while at the same time allowing the packer-manufacturer a free hand in the choice of packaging sizes and relative contents.

Some arguments in favour of total liberalisation through self-provided pre-packaged product quantity ranges could be the following:

(a) mutual recognition of selected sizes as an unfailing necessary condition for free exchange;
(b) greater market flexibility in view of possible future innovations;
(c) consequent resorting to a unit price (unity of price/unity of size) to ensure better consumer protection ([55]).

Except for alcoholic drinks, the United States and Canada (in the latter's case reference is made also to other product categories, even non-alcoholic products) do not provide for the sale of products in 'standard-sized containers'. Consequently manufacturers are free to choose container sizes which they consider best, provided that they do not mislead the consumer, ensuring that he gets a so-called 'informed' choice, although product quantities contained in every package are provided for (the so-called 'fill-of-container' standards).

Table 19

Scenario 2a: No harmonisation but liberalisation					
Legislator	**Legal framework**	**Objectives**	**Nature**	**Ranges of sizes**	**Products**
Super national	Legislation about labelling, unit pricing, metrological controls	(a) to stimulate innovation (b) to stimulate free trade (c) to stimulate globalisation of production	Mandatory	Nothing	Not relevant

([55]) In this respect, American and Canadian legislation is a typical example of consumer protection, this constantly being the underlying principle of all regulation, ensured through compliance with pre-packaging conditions. The American FDA, as already stated, together with the Canadian CPL Act and Regulations have, as their main purpose, the safeguarding of the customer's' health and his so-called economic choices, ensured to provide him with correct information regarding product contents both for quality and for quantity (through proper labelling).

(b) Standardisation

A second possibility would be to allow producers agreements establishing a fixed number of standard sizes, declared compulsory among the parties to the agreement.

Under such circumstances, therefore, a manufacturer wishing to launch a pre-packaged product would be obliged to display in a 'clear and legible' way the unit price of his product (unit pricing) as well as its quality specifications (labelling). Furthermore, to standardise sizes would also mean the standardisation of compliance control methods in order to fully ensure free circulation (consumer protection). Standardising, therefore, without jeopardising quantity range flexibility, without losing sight not only of technological progress and market evolution but also of the continual renewal of the same products, especially in the food sector.

Table 20

Scenario 2b: No harmonisation but standardisation					
Legislator	**Legal framework**	**Objectives**	**Nature**	**Ranges of sizes**	**Products**
Nobody	Agreements among producers of different States	(a) to protect producers interests (b) to facilitate imports/exports (c) to stimulate innovation	Mandatory (among the parts of the agreements)	Depending: minimising ranges or maximising ranges	Not relevant

(c) Mandatory + standardisation or liberalisation

A final possibility would be to keep mandatory sizes for some particular products, more marketed or more relevant ([56]), and for the rest of the products apply producers standards or (as we have just said) liberalise the ranges (no regulation).

Considering the legislation in Canada and the United States and the actual EU ranges of sizes (for example, wine and spirits), some mandatory ranges could be created and for the rest of the products, there could be no ranges or standardised ranges.

In this case the concept of standardisation is that which we have seen in Canada and the United States, where the term 'standardisation' means to create fixed ranges of sizes which have gone from a minimum to a maximum (for each product), so the manufacturers are certainly free to choose the ranges of sizes they wanted, but only among those fixed (= as mandatory) at a European level. In fact, as we have said, without standards, different foods could have the same names or the same foods could have different names, which would confuse and mislead consumers and create unfair competition.

([56]) Such as products charged with an excise tax (e.g. spirits).

Table 21

No harmonisation: Mandatory plus standardisation or liberalisation					
Legislator	**Legal framework**	**Objectives**	**Nature**	**Ranges of sizes**	**Products**
EU and industrial agreements	EU legislation and agreements among producers of different States	(a) to eliminate barriers to trade (b) to stimulate innovation (c) to protect producers interests	Mandatory and standardised	Not relevant	Not relevant

4. Innovation and the pre-packaging chain

4.1. Introduction

The aim of this chapter is to give more insight into the pre-packaging chain and its major innovations. After all, in order to investigate the relation between harmonisation of prescribed ranges of sizes for pre-packed goods and innovation, it is important to know what kind of innovation is taking place in the sector and what actors are involved.

Both parts of this chapter, describing the pre-packaging chain and looking closer at the innovation processes, incorporate some difficulties. Firstly, it turns out to be hardly possible to define the pre-packaging 'sector'. In general, pre-packaging has four important functions:

1. protection (during transportation and handling in the entire product chain);
2. information (volumes, ingredients, etc. directed at consumers);
3. preservation (especially for food products) and
4. marketing (brand identity).

As a result, almost every industrial sector, every company, every product, deals with pre-packaging, striving to fulfil the specific needs of its consumers. This is expressed in the variety of actors that are described in the next paragraph (4.2). One important focus in this project is the choice to focus on consumer packaging as opposed to industrial packaging.

Secondly, when researching types of innovation in the pre-packaging chain, the question to be asked is: 'what is innovation?'. More specifically, 'is every change concerning a packaging an innovation?'. One way of answering this question would be to study the literature that is available, explaining what innovation is and how innovation processes work. In this project, however, we have not used one particular definition for innovation. Instead, we have asked our interviewees that are involved with pre-packaging what innovation means for them. In general, innovation was seen as any change regarding a product, production process, material, service or other, which adds value. This has resulted in a typification for innovation that is based on the packaging features that are likely to be innovated, e.g. new printing techniques for graphical design, new material, new opening and closing systems, new conservation techniques and new functions of packaging elements (paragraph 4.5).

The information in this chapter has been collected by means of desk research and interviews with:

- Mr J. Veraart, Researcher, TNO Food and Nutrition
- Mr J. Roos, Packaging Expert, Ahold
- Mr Verburgh, Manager, Centre of Expertise Packaging, Campina
- Mr S. Schilthuizen, Researcher, TNO Industry

- Mrs M. De Heide (NL), SVM.pact (dealing with the Dutch covenant between the government and packaging sector concerning minimising packaging waste)
- Mr M. Nieuwesteeg, Director of the Dutch Packaging Centre.

4.2. Actors in the pre-packaging chain

The pre-packaging chain is a very complex mixture of many different manufacturers and service providers. Moreover, various actors in the pre-packaging chain, like manufacturers of goods that need packaging, are also part of other production chains. In Figure 2, a schematic overview of the pre-packaging chain is presented.

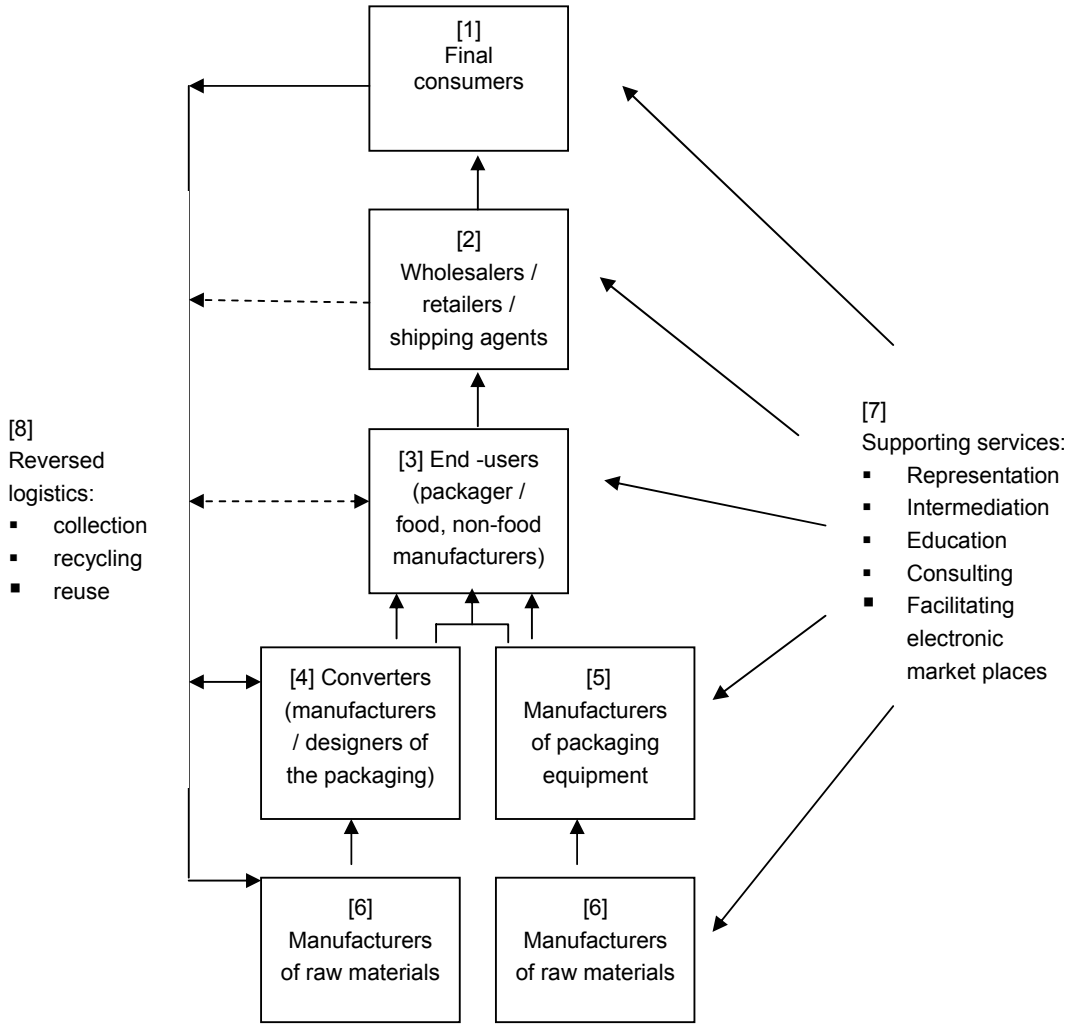

Figure 2. Schematic overview of actors in the pre-packaging chain

Like every other chain, the starting point of the pre-packaging chain is the final consumer [1]. In our project, these are the inhabitants of Europe, buying the products they need, usually including the packaging.

Before these goods reach the final consumer, they have spent some time in the distribution channel. The products need to be transported from manufacturer to wholesalers and retailers [2]. Actors in this link of the pre-packaging chain are large wholesalers and retailers throughout Europe, for example: Ahold, Tesco, Carrefour, SPAR, Coop or El Corte Ingles, etc.

Usually the products are packaged at the manufacturing stage. This can be done by the manufacturer of the consumer goods or be outsourced to a specialised packager. For the packaging company, this manufacturer is the end-user [3]. Examples of large food- and non-food manufacturers of packaged goods are: Unilever, Nestle, Danone, Kraft Foods, Sara Lee / DE, Ferrero, Procter & Gamble, Campina, Heineken, Cargill, Coca Cola, Mars, Tate and Lyle and many others.

At the manufacturers' plant, different streams of goods and equipment merge. One flow of goods consists of the resources needed to produce the product that will need to be packaged. This part of the chain goes beyond the scope of the project and will not be addressed in further detail. Another flow consists of the packaging materials. These are supplied by a packaging company or so-called 'converter' [4]. There are thousands of packaging companies in Europe. Some are very small, specialising in one specific material of application. Some are huge, often grouping together various smaller businesses, and offer a full range of packaging products.

In general, a distinction is made between the following packaging materials: wood, plastic (e.g. PET, PT, flexible packaging), metal (e.g. tins, cans), glass (e.g. bottles) and paperboard (e.g. carton, laminate). Examples of packaging companies are: Amcor (flexible packaging, plastic, metal), Tetra Pak (plastic, carton), Elopak (PET and carton), Variopak (carton), Combi bloc (carton), Huhtamaki/Van Leer (various packagings) or Schmalbach-Lubeca (PET containers and beverage cans) etc.

Next to the packaging material, a manufacturer needs equipment in order to package the products. Suppliers of industrial packaging equipment [5] deliver the necessary machinery. In some cases the supplier of the packaging material and the supplier of the equipment are one and the same company, delivering a so-called 'system solution'. Usually this is the case when a manufacturer is buying a complete packaging concept, like packaging of aseptic milk. Examples of manufacturers of packaging equipment include: Amplas/Hensen (flexible packaging), Krones and Leybold (PET bottles), Hamba (PET bottles, glass jars), Bosch (various), Sidel Group (PET bottles), Tetra Pak (various) or Elopak (PET bottles, cartons) etc.

Finally, both the suppliers of the packaging materials and the suppliers of the equipment need raw materials in order to manufacture their materials or equipment. This is supplied through manufacturers of raw materials [6]. Examples of manufacturers of raw materials include: Corus (steel), Usinor (steel), Rasselstein Hoesch (steel), Aceralia Sidtahl Iberica (steel), Dow Chemical (coatings), Du Pont (coatings, active packaging),

DSM (coatings), Pechiney (aluminum), Philips (coatings with electronic circuits), StoraEnso (paper/carton).

Next to these more or less industrial actors, the pre-packaging chain also includes various services providers, like intermediaries, representative bodies, consultants, research institutes and other business services [7]. This is explained in more detail in the next section.
Moreover, besides the chain of actors that manufacture a product for the final consumers, there is another chain facilitating the reverse logistics [8]. Actors in this chain collect, reuse and recycle products that have been discarded by final consumers and to a lesser extent by wholesalers, retailers and manufacturers. Examples of privately and governmentally funded organisations dealing with reverse logistics are: Watco/BFI, Shanks, Fost+, DSD, etc.

4.3. Services

There are various service suppliers which offer supporting activities to the numerous actors in the pre-packaging chain, for example intermediaries, consultants, research institutes and other business services.

With regard to the project, an important group of supporting organisations are the representative bodies. One important body for the pre-packaging chain is the European Packaging Federation (EPF). This European federation unites 15 national organisations in EU Member States and forms a wide network of actors with interests in the pre-packaging chain. Activities of EPF members include giving information, facilitating formation, educating and communication both within the network and with other relevant parties like policy makers and consumers. The EPF is a member of the World Packaging Organisation (WPO).

Europen, the European Organisation for Packaging and the Environment, is another organisation active in the pre-packaging chain. Its aim is to achieve ‘a barrier-free European market for packaging and packaged products, based on the freedom to innovate and freedom of choice, in order to make best use of the functions of packaging in society and its contribution to sustainable development’ (homepage Europen).

Members of these organisations are usually packaging manufacturers and end-users. Next to the organisations that safeguard the interests of actors in the entire pre-packaging in general, there are various umbrella-organisations that represent specific players in the pre-packaging chain.

An organisation that aims at one specific type of converters is the ACE, the Alliance for Beverage Cartons and the Environment. This is an international coalition of paperboard and beverage carton manufacturers, ‘working together to raise awareness of the consumer and environmental benefits of the beverage carton and to address related environmental issues’ (homepage ACE).

Examples of organisations grouping several end-users in the pre-packaging chain are:

- AISE, the *Association Internationale de la Savonnerie, de la Detergences en des produits d'Entretiens*
- CEPS, the European Confederation of Spirits Producers
- FIVS, International Federation of Wine and Spirits
- CIAA, the Confederation of the Food and Drink Industries of the EU
- UNESDA, the European trade association representing the soft drinks industry
- CBMC, the trade confederation for the brewing industry in Europe
- EDA, the European Dairy Association (member of the IDF, the International Dairy Federation)

Examples of organisations grouping several manufacturers of raw materials are:

- The Aluminum Association
- APEAL, the association of European Producers of Steel for Packaging
- CEPI, the Confederation of European Paper Industries
- CEFIC, the European Chemical Industry council

Retailers, wholesalers and international trade companies are represented in the EU by Eurocommerce.

BEUC is the European Consumers' Organisation. This federation of independent national consumer organisations from all Member States of the EU and other European countries 'tries to influence, in the consumer interest, the development of EU policy and to promote and defend the interest of all European consumers' (homepage BEUC).

The role of these umbrella-organisations is very important in the innovation process. Although the innovations themselves arise in individual companies, the umbrella-organisations can facilitate a harmonisation process. An example of this is the case of the volume and size of washing powder. While each of the large producers of detergents was able to supply smaller, more concentrated volumes of washing powder, each was reluctant to market it. The AISE facilitated a process in which each producer eventually produced mainly smaller packages.

Another important service that is used by the packaging chain, is research. Not all the actors have sufficient capacity or financial means to conduct their own research.
Institutions that are often hired to support the research process include TNO (Netherlands), Frauenhofer (Germany), Vito (Belgium), various technical universities throughout Europe, etc..

Another category of companies that support the innovation process are the various design offices. Usually, a distinction is made between functional and graphic design. Functional designers play a particularly important creative role with regard to sizes and forms of packaging.

4.4. Trends and drivers for innovation in pre-packaging

The Dutch National Board for Agricultural Research (NRLO) identified in its 1999 assessment of packaging and conservation technologies, the following trends in the packaging chain:

- *Development of 'active' and 'intelligent' packaging*. Active packaging is a label for various technological applications that change the condition of the packed food to extend its shelf-life and to improve safety or to monitor its properties while maintaining constant the quality of food (see textbox 1).
- *Development of new packaging materials*. One driver for the development of new packaging materials is the need for materials with better mechanical characteristics (like permeability of gases) and less weight. Another driver is the need to replace environmentally damaging materials.
- *Need for product and function-specific packaging*. Due to the shorter product life cycle, each new product needs specific packaging in order to differentiate it from an alternative product.
- *Packaging as an information carrier*. Packaging is used more and more to sell the product. As a result, more and more attention is given to the shape and colour. For example, materials need to be transparent and suitable for printing and display additional information like recipes or instructions for use. The latest trend is integrating a transponder (a chip and a transmitter) which keeps track of the product in the distribution channel, recognises itself at the cashier and is able to instruct the microwave.
- *Increasing need for standardised measures of transport packaging*. In order to optimise truckloads and other handling processes in the distribution channel, there is a growing need for standardised modular packaging dimensions ([57]). This has consequences for the volume of consumer packaging as well.
- *Increasing importance of sustainability*. Separated collection of waste and reuse of materials are in most European countries important issues in environmental legislation. Packaging forms an important reverse stream of material. Therefore, already in the design stage emphasis is put on recollection, recycling and reuse.

Textbox 1. Active and intelligent packaging

Active packaging includes concepts that will absorb oxygen, ethylene, moist or remove compounds that may cause taints. Other systems of active packaging release anti-microbial agents, antioxidants, flavours and/or colours.
Intelligent packaging systems can monitor the condition of packed food: for example to show if there are any gas leaks in modified atmosphere packs, to provide a history of the temperature a product has been exposed to over time or to indicate the presence of microbial spoilage.

Source: TNO Food and Nutrition

([57]) The current modular packaging dimensions are (in centimetres): 60 x 40, 40 x 30, 30 x 20, 20 x 15, 15 x 10, 60 x 20, 40 x 20, 30 x 10, 20 x 10, 60 x 10, 40 x 15 and 40 x 10.

The following question is: 'what or who drives these trends?'. The Internet site Packaging (guarded by Pakexpert), mentions several drivers for innovation in the packaging chain:

- the need of manufacturers to distinguish new types of products from those of the competition. Examples of new products, especially in the food sector include: ecological products, healthy food, convenient products, functional foods (like vitamins), anti-allergy food, cook-it-yourself food, low-calorie food;
- changing rules and regulation, including: environmental regulation (e.g. concerning prevention, reuse, recycling, reverse logistics systems, more economic use, etc), normalisation, stricter health demands;
- new technological possibilities, like: use of anti-microbe or antibacteria systems, use of multiple barriers, active packaging, biological materials, use of plasma-coatings for PET bottles, new filling systems;
- the introduction of new logistic concepts, like: increased standardisation, more modular packaging systems, optimal use of transport capacity, supplying goods that have been ordered virtually;
- changing consumer needs, for example: demand for convenience goods, for budget packaging, premium packaging, virtual shopping, individual packaging, 'smart' or 'active' packaging and importance of lifestyle, a good imago or product safety.

Interviews with company experts result in a list with similar drivers. According to the interviewees, innovation is driven by a mixture of factors, like the need for cost reduction, new rules and regulation, changing consumer demand, autonomous technological developments, etc. With respect to the pre-packaging chain, the following drivers are especially important: consumer convenience. (Lack of) Convenience is an important factor for consumers to select and purchase (or not) a certain product. Items that influence the convenience include easy openings, clear information, easy handling and easy application.

- *Brand identity*. Innovations often relate to the marketing of a product. This can be an entirely new product line, a product that needs to be rejuvenated or a new product that is based on an existing product line.
- *Environmental aspects*. Environmental regulations play an important role in packaging. Important points of attention include weight of the material, composition of the materials and possibilities to reuse or recycle the materials.
- *Costs*. The importance of costs of packaging heavily depends on the product that is to be packaged. It makes a lot of difference whether one needs to package a dairy product or cosmetics.
- *New technologies*. New technologies can facilitate entirely new processes and concepts of filling, facilitating new ways of packaging, using other materials, other forms, other printing techniques, etc.

Depending on the purpose of the packaging (imago, protection, transport) and the market segment, some drivers are more important than others.

Table 22

Drivers of innovation in pre-packaging
▪ Consumer convenience ▪ Brand identity ▪ Environmental aspects ▪ Costs ▪ Availability of new technologies

4.5. Typification of innovations in the pre-packaging chain

In general, innovations can be categorised in three types of innovation.

1. Product innovation – including new markets.
2. Process innovation.
3. Organisational innovation – including innovations concerning logistics or consumer interface.

In practice, innovations concerning the size and volume of pre-packaging mostly originate from either process or product innovations. Often, the process of packaging and the packaging itself are very much related, which in some cases makes it hard to make a distinction between process and product innovations. In theory it would also be possible that organisational innovations influence the size and volume as well, for example, when a new system for reverse logistics would require certain measurements in order to facilitate recycling and reuse of packaging materials.

The types of innovations are numerous and reflect the needs of manufacturers to constantly meet the demands of their specific consumers. Examples are:
- graphical design (including printing techniques)
- form
- material (composition, weight, mechanical and chemical characteristics)
- opening/closing system
- conservation techniques
- function of the various packaging elements

These categories form the basis of a typification of innovations in the pre-packaging chain (see Table 23). The ultimate mixture of features that change depends on the specific consumer needs, and it is clear that size is only one of many features that are involved in innovation processes.

Table 23

Typification of innovations in the pre-packaging chain	
Typification	**Illustration**
Graphical design	▪ Printing on flexible, transparent, packaging ▪ Printing on new laminate structures
Form	▪ Smaller sizes ▪ Different shapes: pyramid packages, sculpted images, ergonomic grip
Material	▪ Move from a carton/inner wrap format to a stand-up bag. ▪ E.g. a margarine package with greater resistance to fat migration and protection against oxidation when exposed to moisture and sunlight.
Opening / closing systems	▪ Completely new system, e.g. preventing product loss and contamination ▪ Improved convenience existing systems, like easy to use for handicapped persons or requiring no tools, like scissors ▪ A re-sealable convenience food bar ▪ Changing opening width, e.g. making it easier for children to top their food
Conservation techniques	▪ Active packaging ▪ Intelligent packaging ▪ Improved filling techniques for perishable products
Function of packaging elements	▪ PE-labels that serve as information carriers and carrier-grip ▪ A perforated shelf in a steamer tray that makes it possible to utilise the steam from the liquid part to heat the product above the shelf. ▪ A package that serves as a puzzle (turning different puzzle rings into their matching positions)

4.6. Identification of main sectors susceptible to innovation impacts

In paragraph 4.4, various drivers for innovation in the pre-packaging chain are mentioned: increasing consumer convenience, improving brand identity, decreasing the environmentally damaging impact, minimising packaging costs and availability of new technologies. Although these drivers concern almost every product that needs to be packaged, for some products they are more relevant than others. E.g. brand identity is especially important in sectors with a lot of suppliers, all selling a product that is more or less the same, like dairy products (milk, yoghurt, etc.), regular beer, pasta, cosmetics, shampoo, etc.. For these kinds of products, packaging is an important medium to differentiate from the competitor's products.

Decreasing the environmental impact is particularly important for manufacturers and retailers with a strong imago, some of them selling products under their own name, who are susceptible to consumer bans and who have the power and possibility to make some changes, like Unilever, Interbrew, Spar, Carrefour, etc..

Minimising packaging costs, although always welcome, is far more important for manufacturers of relatively low-priced goods, like (staple) and semi-commodity food, than for firms that sell high-priced products like cosmetics or perfumes. Not only because the costs of packaging are easier to integrate in the total cost in case of an

expensive product but also since in the cosmetic sector, the packaging itself has a high added value.

New technologies in the pre-packaging chain refer to a large extent to the food industry. Improving the tenability of perishable goods, improving the quality of freshly packaged vegetables, designing new packaging that can be used to cook the contents and changing chemical and biological characteristics of materials, are only a few examples of new technologies in the packaging chain, referring to food.

Based on the observations described above, a sector that is particularly susceptible to innovation is the food sector, more specifically, complex products like freshly packaged vegetables and frozen and ready-to-eat meals.

5. The relationship between prescribed ranges of sizes and innovation

5.1. Introduction

In this chapter, the main subject of this study is addressed: the relationship between regulation of pre-packed sizes and innovation in the packaging chain. In Chapter 4, we already concluded that innovation in the pre-packaging chain is diverse. Even when focussing on innovations specifically concerning size, different drivers and ways of innovation are relevant, depending on the type of the product.

Originally, it was planned to do a survey concerning innovation in different sectors and the role of regulation. However, after a few pilot interviews, it became clear that it is very difficult to draw unambiguous conclusions concerning the complex relation between regulation and innovation in the pre-packaging chain, more in-depth insight was needed. Case studies are a better instrument to gain this more detailed knowledge than the survey that was foreseen in the original research plan.

In total, almost 20 face-to-face interviews were held, covering a substantial part of the wide range of actors involved in packaging (see Table 24). During these interviews a standard questionnaire was used, expanded with some questions that had been adapted to the specific situation of the actor. Each interviewee received the questionnaire in advance in order to help him or her to prepare the meeting. The questionnaire has been improved during the entire project.

The lessons learnt from the pilot interviews are reiterated in the following paragraph. As the overall conclusion concerning the relation between prescribed ranges for pre-packaging and innovation is case-by-case related, paragraphs 5.4 to 5.8 sketch the relation between prescribed quantities and innovation for five specific pre-packed products: soft drinks, wine, coffee, yoghurt and frozen food.

Table 24

Interviewees	
Name	**Organisation**
Face-to-face interview	
▪ Ms. B. Dufrene	AFCASOLE (*Association des fabricants de café soluble Européenne*)
▪ Mr A. Huisman	AFCASOLE (*Association des fabricants de café soluble Européenne*)
▪ Mr H. Castberg	Vice President of New Technologies and Intellectual Property Elopak (Converter), Spikkestad, Norway
▪ Mr A. Manuel	Packaging Expert Johma (Manufacturer of Salads), Losser, The Netherlands
▪ Mr G. Pré	Assistant Vice President, Packaging Development Department Nestlé (Food manufacturer), Switzerland
▪ Mrs H. Sullivan	Economic Affairs & Communication, UNESDA-CISDA (Union of EC Soft Drinks Associations), Brussels, Belgium
▪ Mr A. Beaumont	Secretary General UNESDA-CISDA (Union of EC Soft Drinks Associations), Brussels, Belgium
▪ Mrs Marquardt	Product Safety & Regulatory Affairs, Food and Beverages Europe, Middle East and Africa, Procter and Gamble (Manufacturer of diverse products), Germany
▪ Mr F. Lopez Romasanta	Director de calidad Gonzalez Byass (Manufacturer of sherry), Jerez, Spain
▪ Mr Marin Estévez	Director de logistica Gonzalez Byass (Manufacturer of sherry), Jerez Spain
▪ Mr L. Gryglewicz	AISE (*Association Internationale de la Savonerie, de la détergence et des produits d'entretiens*)
▪ Mr P. Dierxcsens	Person in charge of environment and external relations Belux, Danone (Food manufacturer), Brussels, Belgium
▪ Mr J. Vaessen	Secretary General EUCA (European Federation of Associations of Coffee Roasters)
▪ Mr P. Locret-Lachaud	Champagne Locret-Lachaud, Hautvillers, France
▪ Mr A. Kleijs	Director of Noordman Wijnimport (Wine importer), Leiden, The Netherlands
▪ Mr H. Hoenderdos	Director of Wijnkelder Brouwersgracht (Wine cellar), Amsterdam, The Netherlands
▪ Mr A. Heaney,	Company Regulatory Affairs Manager of Birds Eye Wall's (part of Unilever, manufacturer), London, UK
Telephone or e-mail	
▪ Mr H. Koekoek	Chief Technology Officer Huthamaki oyj (Converter)
▪ Mr R. Miles	European Marketing Manager of beverage cans Schmalbach Lubeca Continental Can Europe (Converter)
▪ Mr P. Flint	Cadbury Schweppes (Manufacturer of soft drinks)
▪ Mr D. Williamson	CEPS (*Confederation Europeenne des Producteurs de spiritueux*)
▪ Mrs K. Recke	AIM (European brand organisation)

5.2. Pulling and pushing forces concerning innovation in sizes

The conclusion drawn in Chapter 4, that size is just one of many features that are subject to changes when innovating a product, was confirmed in all interviews. Innovations in packaging involving a change in size, usually originate from one of the following two forces.

- The use of size as a marketing instrument. To facilitate product differentiation and to better serve consumer needs, the pull from the marketing side generally tends to be to extend or completely abandon the existing range of sizes. A new size may support product differentiation by:

  - creating a new market segment for the producer (e.g. small quantities of fruit juice for children to drink during lunch break);
  - allowing new needs to be served (selling half-litre bottles of soft drinks to drink at any occasion outdoors); or
  - allowing old ones to be served in a new way (as seen from the consumers' point of view) (selling pre-manufactured mixtures of already separately existing soft drinks).

  Next to this, a new size may also be used for its signalling function in promotional campaigns.

- To improve efficiency in logistics and to realise economies of scale in the packaging stage, the push from distribution and production management is for standardisation, i.e. for a smaller range of sizes. In that case, size plays an important role in the logistics of distribution and of production management.

An example of the contradictory interests of these two forces is the size and shape of products, packaged in a carton box. In order to attract the consumer, it might be a challenge to design and manufacture boxes with round curves. Conversely, to cut cost and transport the goods as efficiently as possible, straight angles are preferred, enabling an optimal use of available pallet- and truck space.

The relative strength of these two forces tends to change when you move up or down the value added chain. And it is likely to vary with the actual balance of power, both between the links of the value added chain of a particular industry and between various departments within one organisation. An example to illustrate the different balances of power between links in the chain is the constant lobby of manufacturers for shelf space at the retailer's. Interviews with both a large retailer and various manufacturers, highlighted that manufacturers of so called A-brands have quite some bargaining power and can, within certain limits, package their products in a size and shape they see fit. Manufacturers without bargaining power, so called 'me-too manufacturers' however, are faced with very detailed demands concerning size and shape in order to be granted some shelf space.

5.3. Impact of regulation on innovation

5.3.1. Large variety

Both in the European Union and beyond, the regulatory regimes for packaging sizes that are in place, cover only a part of all products on the market. Lots of products face no regulation at all and the European Commission has repeatedly expressed the intention not to expand the number of products that face regulation concerning the range of sizes allowed.
Examples of products that are affected by mandatory or optional regulation include: wine, spirits, soft drinks, beer, milk, water, fruit juices, butter and margarine, pasta products, rice, ground or unground roasted coffee, ready-to-use paints and varnishes, solvents, cleaning products, detergents and knitting yarns.

The way in which the legal situation influences innovation varies per sector. Firstly, pre-packed products are subjected to different degrees of regulatory requirements (mandatory or optional, small or large ranges). Secondly, packaging innovation is driven by a mixture of factors and size is only one of numerous features that is likely to change (see Chapter 4). Thirdly, the initiative to innovate isn't always taken by the same party. There are occasions in which the converter (supplier of packaging) innovates, as well as situations in which the manufacturer (consumer of the packaging) takes the lead.

The central issue is that each link in the packaging chain is catering for the needs of its customer, whether it is a manufacturer or a final consumer. The sorts of innovation in packaging are many and reflect the variety of needs for which each actor caters.

Regulation has its impact through the outcome of the clash between the earlier mentioned pulling and pushing forces. It influences their relative strengths and it may determine the rules of the game in which they meet.

5.3.2. Impact depends

In general, the regulatory strategies for packaging sizes that are in place in the world's markets, affect the freedom of producers to manipulate this particular feature of packaging in varying degrees. A large range of permitted sizes obviously allows more freedom to choose a particular packaging size than a small range.

The absence of EU regulation in a sector does not necessarily mean, however, that the producer there has more freedom than in another sector.

- Retailers may be those who determine the range of sizes in which they can market their product instead.
- 'Sunk costs' (e.g. not-yet-amortised packing lines) may limit the room for a marketer to manoeuvre.
- Varying national legislation and consequent fragmentation of the market due to lack of harmonisation, may impair the ability to realise economies of scale and thus limit the range of usable sizes.

In some cases, European mandatory regulation may in fact enhance the producers' freedom to use packaging size as a management tool, including the management of innovation in products, markets and production processes.
In other cases, any prescription of volumes or weights would seriously interfere with the actual running of a business, as it may consist of catering to changing consumer demands by offering complex products in a great variety of quantities and sizes.

5.3.3. Role of unit pricing directive

One additional aspect that has often been mentioned during the face-to-face interviews, is the role of the unit pricing directive. Supporters of the existing range of sizes within their sector argue that the unit pricing directive doesn't fulfil its purpose, since consumers are not always reading the unit price, and may be misled if some manufacturers use sizes that are just a bit smaller than the regular sizes.
Adversaries of the existing range of sizes within their sector are convinced of exactly the opposite effect. According to them, the unit pricing directive guarantees that consumers are protected. Consequently, there supposedly is no reason to maintain the current ranges of sizes, since they serve no other purpose than to protect non-innovative parties in the sector.

Since the objectives and results of the unit pricing directive are not the subject of this study, this matter has not been investigated in further detail. Based on the opinions in the interviews, no objective conclusions can be drawn as to how the unit pricing directive does or doesn't preclude the need for mandatory EU regulation concerning pre-pack sizes.

5.3.4. Case studies

It is fair to conclude that the impact of prescribed quantities on innovation varies with the case considered. How it varies, is illustrated in five specific cases in the following paragraphs.

In paragraphs 5.4 to 5.8, five specific illustrations are presented, explaining the relationship between prescribed quantities and innovation for each individual product. The aim of these illustrations is to sensitise the reader for the various ways in which pack size regulation relates to innovation. We call them 'short stories', as they are not based on the comprehensive 'triangulatory' data gathering which is prescribed in the methodological textbooks about case studies. What we offer the reader is based on a number of interviews with people from some of the 'links' of the value added chain of five products from the food and beverages sectors.

As it is, we believe that the information we offer is adequately grounded for the purpose stated above. Soft drinks, wine, coffee, yoghurt and frozen foods are different types of products, with various consumers and markets and subjected to different regulatory regimes and innovation processes. Moreover, the actors involved have different perceptions of the benefits of prescribed quantities. One common feature of innovations involving pack sizes of these products is the adding of one additional step to the end of the value added chain. For example: selling pre-mixed combinations of soft drinks, single serving portions of coffee, one-person bottles of wine or ready-to-eat (pre-cooked) meals.

Demographic trends and social-cultural changes will not be explicitly and separately considered, but integrated in the case descriptions as a given context for all the sectors involved. These case descriptions will also illustrate the way producers and distributors use packaging of different sizes to innovate and market their products, what regulation they have to pay attention to and how these two aspects interrelate.

5.4. The battle for the fast moving soft drink consumer

This short story is about soft drinks in general ([58]).

5.4.1. The product and the business ([59])

Soft drinks is a label for a wide variety of non-alcoholic beverages, such as: carbonated drinks, water, fruit juices, iced tea, sport drinks or energy drinks. In 2000, the total consumption of soft drinks in Europe amounted to ca. 80 000 million litres.
This includes carbonated drinks (27 000), packaged water (34 000), fruit juices (9 000) and other soft drinks like iced tea and sports and energy drinks (10 000). In recent years, annual sales of carbonated soft drinks alone were worth more than EUR 38 billion. The average per capita consumption of carbonated drinks in Europe was around 73 litres in 2000. In recent years, sales of sports and energy drinks in particular have risen substantially. Moreover, increasing health has resulted in increased sales of relatively more expensive smaller volumes of soft drinks (like 50 cl and 25 cl).

The industry is characterised by a large number of parties, involved in bottling, producing and marketing their own brands as well as numerous franchisers of major global brands. Competition is fierce and consumer demand is changing rapidly. One of the hardest challenges for soft-drink producers trying to sell both new and existing drinks, is to catch the attention of busy consumers that are faced with a broad spectrum of choices.

5.4.2. Regulation and range of sizes

EU Directive 75/106/EEC provides for optional ranges for soft drinks. A range of nine possible sizes is suggested. At the same time, on a national level, most countries have mandatory legislation concerning the allowed sizes for soft drink packaging. However, these mandatory ranges for sizes allowed for soft drinks differ per country. As a result, a wide variety of mandatory ranges of sizes is spotted amongst the different EU Member States.

5.4.3. Innovation and the importance of size

The most important driver for innovation in the soft-drink sector is changing consumer demand. Soft drinks are fast moving consumer goods and adapting the flavours and images of the drinks to the changing taste and fashion of consumers is essential for businesses to survive in this sector.

([58]) Based on interviews and written exchange of information with: Mr A. Beaumont and Mrs H. Sullivan, UNESDA-CISDA, Brussels, Belgium.
Mrs Marquardt, Proctor and Gamble, Germany.
Mr Flint, Cadbury Schweppes, United Kingdom.
([59]) Source: UNESDA

The size and volume of soft-drink packages are essential elements in the innovation process.

- Modern consumers are constantly on the move. As a result, a wide range of convenient packages and dispensing units are being designed in order to make soft drinks suitable to every occasion and available at every hour. In practice this means that the size of the packages is closely related to the need of very specific consumers. For example: in order to meet the need of children, very small packages are introduced, which can be taken to school and drunk during (lunch) breaks. On the other hand, king size family packages are designed in order to meet the needs of consumers with a large household.

  Generations between these two extremes often demand specific hand-held sizes, easily to consume at any time and anywhere the consumer pleases.

- Modern consumers have a lot of options when they buy a soft drink. In order for a producer to make a product distinguishable from competing soft drinks, a striking packaging is essential. Introducing a new size is considered to substantially improve the capability to differentiate a brand from that of a competitor.

- Modern consumers are willing to pay for new products, which combine existing (soft) drinks. This fits within the trend that producers are taking over parts of the activities that used to be performed by the end consumer. For example: in Germany, in restaurants and bars, consumers can order a 'schorle'. This is a combination of sparkling water with fruit juice (usually apple juice).

Nowadays, this combination is no longer necessarily mixed on the spot, but can also be obtained in a ready-to-drink mixed alternative. In order to raise consumer awareness of this new product, using a package with a variant size is considered to be helpful.

5.4.4. Innovation and regulation

In the majority of EU Member States, mandatory regulation is in place concerning the range of pre-packed sizes for soft drinks. However, the range differs per country. In theory, this variety does not form a barrier to trade, nor does it hamper innovation, since due to the *Cassis de Dijon* ruling, no size that is allowed in one Member State, may be banned from the market by other members. Still, in practice, mutual recognition is not always in place and manufacturers of soft drinks feel the need to adapt the sizes of their packages according to the possibilities in individual Member States.

According to various parties that have been interviewed, the national mandatory legislation concerning ranges of sizes does pose a barrier to trade, since in practice, cross-border transfer of pack formats is not always possible due to national restrictions. In particular large family-sized packages and small, single-person children lunch packs are excluded from the market in several countries. Another example of the perceived trade barrier is that of manufacturers within a country with mandatory ranges which are restricted from using other sizes, whereas importers from other Member States can sell any size in that country.
These trade barriers would narrow the potential market and therefore, limit the possibility to introduce a set of sizes and to earn back investments concerning

innovations regarding the size of soft drink packs. As a result, current national mandatory pre-packed sizes may hamper innovation in pre-packed sizes in the soft drinks sector. **Although *in fact* the current legislative regime does allow for product innovation, interviewees feel that more innovation would take place if national ranges would be either harmonised or abolished, increasing the market for 'new' sizes of soft drinks.**

Not prescribing pre-packed sizes might induce innovation, say our interviewees, as this would enable manufacturers to use any size which would meet consumer demands and market this size in all relevant European countries. One important condition for this line of thinking is that not prescribing pre-packed sizes by the EU doesn't stimulate national governments to pose mandatory ranges. In other words, not prescribing pre-packed sizes may only help to induce innovation if national governments join the EC in abstaining from prescribing ranges. This is also the preferred scenario for refillable bottles. Although for refillable bottles, some degree of standardisation might be useful, decreasing handling costs in the reversed logistics chain, the fear exists that standardisation for the sake of easy handling alone would especially favour non-innovative companies, as any incentive to innovate would disappear.

5.5. 'Le kilo du vin'

This short story is about the packaging of wine, including sherry and champagne ([60]).

5.5.1. The product and the business

Wine is traditionally consumed as a refreshment and with meals by the people of many (mostly southern) European countries. Of old, wine has also been taken as an aperitif or as a treat, a luxury, to be savoured with elaborate ritual. Wines come at all prices, from very cheap to very expensive.

Over the years, the increase in wealth of the average European household has made champagne accessible to many more people than before, as its prices have stabilised over the decades. In the old days (30 - 40 years ago) a hectare produced 4 000 litres per year. Today that number is 10 000 to 13 000. Moreover, half a harvest is always kept apart, as a buffer against price fluctuation. The price of champagne is calculated among producers according to that year's harvest. Producers of other sparkling wines, such as champenoise and sekt, follow the champagne prices at an appropriate distance.

Champagne today is no longer a luxury product. It remains however, a *produit de bienêtre*, and its consumption is a social happening: people usually drink champagne when there is something to celebrate. The statistics of a country's consumption of champagne are like a *baromètre* of the mood of the nation. Champagne sales soared just after 27 September 2000, as countless Frenchmen toasted for relief of not being hit by

([60]) Based on field research and interviews with:
Philippe Locret-Lachaud of Champagne Locret-Lachaud, Hautvillers, France;
Fernando Carlos López Romasanto and Jaime Marín Estévez, Quality and Logistics Directors respectively, of Gonzalez Byass, Jerez, Spain;
Anton P. Kleijs, Director of Noordman Wijnimport, Leiden, The Netherlands;
Hans J.H. Hoenderdos, Director of Wijnkelder Brouwersgracht, Amsterdam, The Netherlands.

the great storm that passed over France that day. Immediately after 11 September 2001, sales plummeted and remained at a lower level since.

The popularity of sherry with the people of the British Isles dates back to the days when Her Majesty's navy destroyed large chunks of the Spanish Armada in its harbour and its sailors plundered coastal cities of Andalusia. They drank huge quantities of the great wines of Jerez and brought the rest of it home. Today sherry has to compete with many other aperitifs, from beer to Campari, but still holds its ground in the market.

In some countries, like the Netherlands, drinking wine has only become a widespread habit in the last couple of decades of the 20th century. The fact that supermarket chains such as Albert Heijn have taken up marketing wine has greatly contributed to this. As recently as 10 years ago, virtually all wine that was marketed within the EU originated from the traditional wine-producing countries of Europe.

Prices of popular European wine - Bourgogne, Bordeaux – have gone up considerably over the last decade, because of a surge in their export to America. Nowadays, producers from 'The New World', North and South America, Australia, South Africa have also taken their shares of the European market.

A small number of large producers, marketing their product under brand names like Gallo of California and Jacobs Creek of Australia have thus joined the many thousands of smallish wine farmers or farmers' cooperatives that traditionally catered for the needs of European wine drinkers.

Likewise in the retail business, a small number of big parties operate alongside many small ones. In the Netherlands, for example, 50 wine sellers have 90 % of the market and 1 050 registered wine traders cater for the other 10 %. European wine producers tend to be regionally organised in consortia that maintain standards for the composition of wine, or they are subject to public regulation with the same purpose.

5.5.2. Regulation and range of sizes

The packaging of wine to the European consumer is subject to an extended, mandatory range of quantities per bottle. The range extends from 0.05 to 10 litres. The regulation allows for different forms of packaging, but most wines are bottled in Bordeaux, Bourgogne or Champagne bottles.

5.5.3. Market trends in pack sizes

As is the case with Jerez and other wines, 90-95 % of all sparkling wine is sold in 0.75-litre bottles ([61]). This has not changed since the range was introduced. The size of the boxes in which the bottles are packed has decreased over the decades, from 30 bottles per box to six.

Mr Locret-Lachaud believes that this may have to do with many champagne drinkers no longer living in houses with wine cellars, but in apartments with stairs to be climbed. Moreover, more people nowadays travel in their own cars to the countryside to purchase

([61]) With a content in alcohol ≤ than 15%

their champagne directly from the producer, he observes. Obviously, a six-bottle box is easier to handle for the average consumer than the 30-bottle box of the old days. Mr Locret-Lachaud doesn't perceive any consumer demand for champagne in smaller bottles now or in the future – it would be against the nature of the product, he believes. For producers, he thinks it would be sheer folly to push for smaller bottles and compete on price to achieve that. He explains the enduring popularity of the 0.75-litre wine bottle partly by referring to the small profit margins realised by the wine producers. This margin only diminishes when the wine is sold in smaller sizes as the packaging costs per unit increase, as is illustrated in Table 25.

Mr Hans Hoenderdos, of Wijnkelder Brouwersgracht, a specialised retail outlet and of restaurant Lorreinen, both in the centre of Amsterdam has been in the retail business for more than 20 years. He recalls that it was once tried, in the early 1990s, to introduce the half-litre bottle. The introduction, although it was accompanied by a publicity offensive, was not much of a success, according to Mr Hoenderdos. Mr Kleijs of Noordman Wijn Import, a wholesaler who delivers wine to both specialised retailers and to supermarket chains, thinks that the half-litre bottle is a relative success: 'Here and there it has been tried and accepted'.

Undoubtedly, the 0.75-litre bottle remains as popular with the consumer as ever. In his restaurant, open wine is mostly ordered by the half-litre. But in all his years in the shop Mr Hoenderdos has never heard a customer ask: 'Could I have my wine in another bottle size?'

5.5.4. The cost of variation in sizes

The packaging costs of wine per unit increase when the bottle gets smaller, as is explained in the table below.

Table 25

Packaging costs of wine per unit(*) increase when the bottle gets smaller		
Cost element (in FF)	**0.75 litres**	**0.5 litres**
Glass bottle	2.50	2.20
Capsule	0.27	0.93
Bouchons	1.51	1.51
Habillage	0.70	0.70
Muselet	0.29	0.29
Handling	5.-	5.-
Six-bottle box	4.-	8.-

(*) As of December 2001.

On top of this come the costs of resetting bottling lines. In addition there are costs to be incurred in the distribution chain, as it is entirely adapted to accommodate the six bottles of 0.75-litre boxes.

It is difficult to make any statements on the impact of amortising packing lines on the cost of variation. Not all variation in bottle size would involve replacing packing lines.

The amortising period for packing lines is long: Gonzalez Byass refers to a period of 10 years. At Locret-Lachaud's the packing line has already been in use for 20 years and there is still no need to change it. There are also costs to be incurred in the distribution chain as it is designed to accommodate the six or 12 bottles of 0.75-litre boxes.

5.5.5. Innovation and pack size regulation

The main innovation in the wine business of the last decade has been the branding of wines. Before, and still nowadays for the most part, popular wines are generally marketed rather as of a region (Bordeaux, Bourgogne) or of a sort of grape (Merlot, Chardonnay) than of the house. Of these wines, it is accepted that their quality varies from year to year with the quality of the harvest. The new brands (Gallo, Jacobs Creek, Piat) offer wine with consistent quality each year. This innovation does involve changes in packaging, but not of its size. Mr Kleijs, the wholesaler, observes a trend to use heavier bottles, meant to purvey, with richly decorated labels, an image of wealth. An attempt, he thinks, on the part of the big producers from the New World, to appear more 'chic'. Product innovation in the wines of Jerez, consists mainly of efforts to enhance the stability of wine, to extend its tenability. These innovations do not involve changes in bottle sizes and have in no way been hampered by the pack size regulation.

An innovation in wine packaging is the 'bag-in-box' of five or 10 litres, that was introduced in the early 1990s. It consists of a laminated foil bag in a carton box. The bag-in-box maintains a vacuum, while it is emptied in the glass through a small tap in the box. The wine can thus be kept in good condition for two months. It is used in restaurants and in private households, but its small market share has remained stable for years. The mandatory, but extensive range of pack sizes leaves producers enough freedom for this type of innovation involving change in pack size.

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'The champagne sector is conservative', says Mr Locret-Lachaud. There is no innovation in the bottle used, he says, other than experiments with different forms, in small series, for promotional reasons, and changes in material of labelling and closure of the bottles, for environmental reasons. The possibilities for varying the form of the bottle are not limited by regulation, but by the fact that there is high pressure within the bottle. The material innovations driven by environmental considerations include:

- new paints used on labels;
- thinner glass used for bottles;
- thinner material for cardboard boxes;
- switch from lead to tin for capsules.

Prescribed quantity regulation is not perceived as an impediment to innovation in the wine business. 'The present range of sizes allows us to serve our customers with all the conceivable functions our product might have', say Mrs López and Marín of Gonzalez Byass. '0.75 litres is simply a good, convenient, volume for wine to be purchased in', says Mr Kleijs, the Dutch wholesaler.

5.6. The introduction of single portion coffee

This short story is about the packaging of coffee, both roasted and the instant variety ([62]).

5.6.1. The product and the business

Coffee is still largely a national product. Most nations have their specific 'taste spectrum' and their own ways of making coffee. The coffee market in general is a stagnant market. The market shares of soluble coffee and of ground and roasted coffee vary strongly from country to country. Although soluble coffee is pure, dried coffee, for some it is not 'real coffee'. In some countries, such as Finland, where per capita coffee consumption is very high, the consumption of soluble coffee is close to nil. There, a pot of coffee is always kept boiling so to speak, eliminating the need for an instant coffee-making product. In general, the bigger the market of a coffee-drinking nation, the less coffee of the instant, soluble variety is sold there.

Because drinking coffee is such a 'national' habit, coffee as a product is not so easily exported. Nevertheless, Europe exports roasted coffee world-wide to smaller markets, such as Canada, countries in eastern Europe and Australasia. In order to serve larger markets, such as that of the United States or Japan, local production facilities are preferred. There are exceptions to this, such as La Vazza espresso, a strong Italian brand well known internationally that exports to countries of both north-western Europe and North America.

Alongside a small number of very large parties, there are many small coffee roasters operating in Europe. Of the instant, soluble variety, 80 % of demand is served by three companies (Sara Lee/DE, Kraft, Nestlé) the rest is served by half a dozen smaller parties. Of these, some are integrated producers (such as Deutsche Extrakt Kaffee, Seda) and others are packers (such as Subilac). 15 % of the consumption is imported from producing countries such as Brazil and India. The packers do the importing and marketing of this share of the soluble coffee supply to European consumers.

Between 1960 and 1980, in Holland, the consumption of roasted coffee per head has more than doubled from 3.55 kg in 1960 to 7.30 kg in 1980. Since then the level of consumption has remained more or less stable. The relative price of the product has, however, continued to decline over the years. In 1958 a German 'blue collar' worker had to work for four hours for 500 g of coffee. In 1985 it was one hour. In 2000 15 minutes sufficed ([63])

All over Europe, the coffee market is now stagnant and some fear, even structurally shrinking as the younger generation appears to drink less hot beverages than their parents do. In that segment of the market therefore, soft drinks are the competition.

([62]) Based on interviews with:
J.A.J.R. Vaessen, Secretary-General of EUCA, European Federation of Associations of Coffee Roasters;
Barbara Dufrene, Secretary-General of AFCASOLE, *Associations des Fabricants de Café Soluble des Pays de la Communauté Européenne;*
Albert Huisman, Senior Food Legal Consultant, Innovation & Quality Center of Sara Lee/DE.
([63]) European Coffee Report 2000, CECA/EUCA, p. 20.

5.6.2. Regulation and range of sizes

Between 1977 and 1999 a mandatory range of sizes was in place for soluble coffee in Europe (EU). Prescribed quantities for packaging and marketing soluble coffee were introduced EU-wide as part of the so-called 'vertical' or 'recipe' regulation. Products such as honey, jams, chocolate, mineral water and fruit juices were also subject to recipe regulation ([64]).

In 1999 the prescribed quantities for soluble coffee were taken out of the 'vertical' regulation. Pending study and deliberation it has not yet been settled whether the range of prescribed quantities for soluble coffee will henceforth be optional or mandatory. At present therefore, there is a legal vacuum at EU level. In some Member States the range has been integrated in national legislation, as is the case in Holland (HPA), France and the United Kingdom. In other States the range has 'disappeared'. The range is 50, 100, 200, 300 and 500 g, all the way up to 10 kg.

Ground and roasted coffee packaging for consumers in the European Union is subject to an optional range of nine sizes (125, 250, 500, 1 000, 2 000, 3 000, 4 000, 5 000 and 10 000 g). In Germany, Denmark and Austria yet another pack size is in use: 400 g. Single portion packaging is excluded from the range. In Holland, Belgium, France, Italy and Spain the optional range of sizes or (prescribed) quantities has been integrated in national legislation.

5.6.3. Market trends in pack sizes

In those countries that adopted the optional range of sizes for ground and roasted coffee, virtually all sales to consumers are in the 250 g and 500 g packs (where the 400 g pack is on the market, it accounts for about 15 % of sales). Over the last 10 years, the ratio between 250 and 500 g packs has been exactly reversed: in 1989 39 % of sales were in the 500 g pack and 61 % in the 250 g pack; in 1999 60 % of all roasted coffee was sold in the 500 g pack and 39.6 % in the 250 g pack. In recent years, a small, but growing proportion (0.2 %) of roasted coffee has been sold in 125 g packs. In this smaller size, the so-called luxury or 'single origin' coffees are sold, from Guatemala, Colombia and Kenya. These are presumably bought for special occasions, or to the 'ambitious consumer', for a higher unit price than 'normal' coffee.

Of soluble coffee, 80 % is sold in 200g glass jars, 5 % in 100g jars and the remaining 15 % in 50 g jars. There has been no significant change in this over the last 20 years. Soluble coffee doesn't have the problem of freshness, as ground coffee does (soluble coffee can be kept on the shelf for 18 months or up to two years). 200 g of soluble coffee lasts about 14 days in an average small household (2-3 people).

([64]) Coffee and chicory extracts (Directive 77/436) ;

'Sugar' (Dir. 74/437) ;

Jams, etc.. (Dir. 79/693) ;

Honey (Directive 74/409) ;

Fruit juices, etc.. (Directive 75/726) ;

Preserved milks (?) ;

Cocoa and chocolate products (?).

5.6.4. Innovation and regulation

Innovation in the ground and roasted coffee branch is product innovation. A most interesting recent development is the marketing of coffee in single portions in combination with newly developed coffee-making machines in joint ventures between e.g. Douwe Egberts and Philips. Although over the last year tens of thousands of these machines have been sold, which make one or two cups of coffee, from single portion 'pads', the coffee sales in this form cannot yet be found in the statistics.

This development entails another approach to marketing and packaging coffee. The focus is on the single cup of coffee – or serving; the starting point in your thinking of coffee is no longer the grounded, roasted form of the product, but the service you render the individual coffee consumer, offering him his nice, hot black or white cup of coffee. Then you sell him a coffee-maker that produces a single or a pair of cups or mugs of nice, hot coffee and the pads he just needs to place in the machine with enough water to do the trick. A 'pod' or 'pad' contains just enough ground coffee to make a savoury cup of the black, hot beverage. These pads are sold in cans or soft packs, containing a particular number of servings. These packages end up outside the range of quantities (233 g, for example).

As yet there is no specific name for this developing line, other than 'convenience'. Mr Vaessen compares this development in the marketing of coffee with the ones that can be seen in the marketing of dairy products (single portion packs of yoghurt and fruit for desert) and spirits (single portions in mixes with soft drinks). **In the case of coffee, this development — entailing out-of-range quantities — is possible because of the exception made in the regulation for single portion packaging[65]. In the hypothetical case that this exception had not existed, then the present regulation would have been an impediment for innovation. As it is, the regulation has not hampered innovation in the branch in any respect.**

Another innovation is in the outlets for coffee, such as the coffee bars and speciality coffee shops of 'The Coffee Company', where one can drink coffee of various flavours and mixed with cinnamon, vanilla or walnut and where one can buy self-packed, self-mixed coffee in varying quantities.

In the market segment for soluble coffee, innovation also involves packaging (the 'sticks'), but is of course more than that. It involves focusing on the one portion serving and premixing ingredients (cacao, flavours, sugar, milk) to realise new product concepts offering new services to the consumer (an instant hot beverage of varying taste). These are called 'new instants' or simply 'specialities'. Examples are 'Vienna café' or 'Wiener melange', cappuccino, Irish coffee and instant coffee with lots of different flavours added such as chocolate, vanilla, cinnamon and walnut. Although only a relatively recent phenomenon, new instants already represent 30 % of the soluble coffee market, in terms of servings (70 % of the market on a kilo basis) and, more importantly, 60 % of the market on retail value basis.

[65] Regulatory exception for single portion packaging: excluded from Art.1 of Directive 75/106 which is referenced in Art. 1.1 as the scope of Directive 80/232

5.6.5. The cost of variation in sizes

'To vary packaging sizes is costly', says Mr Vaessen. A packing machine is optimised for one size. To change involves resetting the packing machine, changing of foils, resetting weighing machines and time. The amortisation period of a packing machine is 10 to 15 years. The machines are custom made by only a handful of machine makers in the world. The practice of collomodular packaging only increases the costs of variation in sizes.

The making of soluble coffee is a highly standardised mass production process, which is concentrated in only 13 factories throughout the EU. There are the usual costs of resetting huge machinery in such factories. The proportion of those costs in the total cost of the product varies with the price of the primary commodity, which is now low, meaning that resetting costs are relatively high.

5.6.6. Retailers' position on variation in sizes

In the coffee business, retailers are an important party in decision making on packaging sizes. Their position on the matter is perceived as ambiguous. Theirs might be a case for more standardisation as a means to manage the 'battle for shelf space'. Shelf space is scarce enough with the growing assortment of product variations. Retailers would not welcome another dimension of differentiation, in the opinion of Mr Vaessen of EUCA. According to Ms Dufrene, however, speaking on behalf of the instant coffee makers of Europe, retailers may be expected to be the party to ask for frequent changes of pack sizes, for promotional purposes (5 % more for the same price) thus raising packaging costs for the industry.

5.7. A world of variation: yoghurt for everyone

5.7.1. The product and the business([66])

With a share of 18 % in turnover, the European dairy industry represents one of the most important sectors of the European agri-food industry. The European dairy industry currently employs 250 000 people, 10 % of which work in jobs directly relating to export. Dairy products include: liquid milk, fermented products, butter, cheese, skimmed-milk powder, whole-milk powder, condensed milk and skimmed milk for casein. In 2000, the 15 countries in Europe produced: 30 000 tonnes of milk, 1 677 tonnes of butter, 6 232 tonnes of cheese, 834 tonnes of skimmed-milk powder, 1 050 tonnes of whole-milk powder and 1 170 tonnes of condensed milk.

Large companies in the dairy industry include: Nestle (Switzerland, EUR 14.105 million turnover in dairy products), Danone (France, EUR 6.529 million), Parmalat (Italy, EUR 6.232 million), Arla Foods (Denmark/Sweden, EUR 5.108 million), Lactalis (France, EUR 4.818 million), Friesland Coberco Dairy Foods (The Netherlands, EUR 3.948), Campina (The Netherlands, EUR 3.894 million), Bongrain/CLE (France, EUR 3.874 million).

([66]) Source: Homepages of European Dairy Association and Produktschap Zuivel.

One important trend in the dairy industry is the perceived need of companies to become larger and larger, resulting in an ongoing stream of mergers.

Yoghurt is one of many products that are manufactured on the basis of fresh milk. The variety of flavours and sizes is enormous (with/without fruits, with/without sweets, with/without sugar, regular/low fat, to eat/to drink, family packs/children's portions etc.), reflecting the aim of manufacturers to meet the demands of many specific target groups.

For dairy producers, yoghurt is a very important product, since it is an important area to increase sales, adding value by mixing the yoghurt with a constantly growing spectrum of non-dairy products, like sweets, chocolates, fruit, cereals, etc.

5.7.2. Regulation and sizes

Currently, yoghurt is not a product that is subject to regulation concerning prescribed quantities. Manufacturers are bound by legislation concerning environmental impacts and food safety, but not by regulation concerning sizes of packs.

5.7.3. Innovation and regulation

Innovation concerning yoghurt products basically concerns the use of new multi-layer covers and the introduction of entirely new products. The use of new covers is driven by the availability of new technologies as well as the possibility to increase consumer convenience (the new covers should open more easily). The introduction of new products is driven by the need to enter new markets and to serve the needs of existing consumers as well as possible.

A remarkable issue in the yoghurt market is the variation in consumer preference, which doesn't only vary per target group, but also per country. Shopping and eating habits play an important role in the decision-making process of consumers. Some consumers shop every day (for example, those in Holland), others only once a week (for example, those in France or Scandinavia). Some eat yoghurt for breakfast, some only for dessert and others use yoghurt as a snack for in between meals. For each of these types of consumers in each European country, different products are marketed.

Small packs, in particular, are subject to many research and development efforts. Firstly, for reasons of stability of the pack, it is more difficult to design a perfect small pack than to design a larger pack. Secondly, because small packs have even more difficulties in catching the consumer's attention than large packs do.

The interviewed manufacturers feel in no way hampered in their innovation process by the absence of regulation concerning pack sizes. On the contrary, they expect that introducing prescribed ranges could only hamper the innovation process since it would not be possible to capture every consumer's current and future preference in a prescribed size range.

An additional argument for not prescribing ranges are the possible 'odd' ideal sizes for individual consumer packs. Nowadays, a lot of packs contain exactly 125 or 250 or 500 ml. of yoghurt. In the future, the contents of a portion might not add up to a range of

round figures, but be based on an average amount of spoons or an average amount of yoghurt that is needed to take away a hungry feeling, adding up to, for example, 118 ml. These 'odd' figures cannot yet be predicted and will also change, based on changing consumer preference. Therefore, they are hard to catch in any regulation concerning pre-pack ranges.

In summary, based on experience with prescribed quantities for other products, like cheese and milk, the manufacturers of yoghurt are very pleased with the current absence of ranges of sizes for yoghurt packs. They cherish the freedom they experience when introducing a new or re-styling an existing product. According to them, it is important to be able to fulfil every consumer's needs, which may imply that 'odd' volumes are introduced, when certain consumers would demand that. Moreover, consumers are different in every country and it will be very complicated to catch the current variety of sizes in a law.

5.8. Packaging to outsource the art of cooking

This is a short story about pack sizes for frozen food ([67]).

5.8.1. The product and the business

The frozen food industry sees itself as catering for people who do not want to, or cannot cook. By buying frozen food they outsource the whole or parts of the process of preparing a meal. On a continuum from very long to short shelf lives, frozen food can be kept well for the longest period, of up to two years, provided it is kept at a stable temperature, after being deep frozen in the factory. Freezing is a very effective form of preservation of food. In theory, if the temperature is kept low enough (minus 26 degrees or below) the food will last for very long periods.

However, in the distribution cold-chain the temperature of storage fluctuates and rises progressively from around 26 degrees to around minus 15 degrees. Home freezers operate at around 18 degrees. Variations in temperature can be physically detrimental to frozen food, and for these reasons it is usual to give frozen food a shelf life of between one and two years only. The bacteriological status of the food remains unchanged.

Chilled foods, such as yoghurts, pizzas or complete meals, are kept at 3 to 4 degrees and have short shelf lives, generally a matter of days. This can be increased by a variety of technological means including high-temperature sterilisation and/or gas flushing of the package. These latter processes can provide ambient stability for some foods. Canned and dried foods can have very long shelf lives, theoretically as long as frozen food. Unlike frozen food, however, the physical nature of the product is substantially changed by the preservation process (see Figure 3).

([67]) Based on an interview with Dr. A. Heaney, Company Regulatory Affairs Manager of Birds Eye Wall's; Birds Eye Wall's is market leader in branded frozen foods (Birds Eye) and Ice Cream (Wall's) in the United Kingdom; it is a part of Unilevers Ice Cream and Frozen Foods Europe Group, with its headquarters in Rotterdam, comprising such companies as Langnese-Iglo (Germany), Sagit (Italy) and Iglo Mora (The Netherlands); Birds Eye Wall's has three large frozen foods factories in the United Kingdom, each with approximately 1 000 employees, making over 200 000 tonnes of frozen foods per annum; its ice cream factory in Gloucester makes ice cream for the UK market. It also imports and exports products in world-wide brands such as Magnum and Cornetto form and to sister companies in continental Europe.

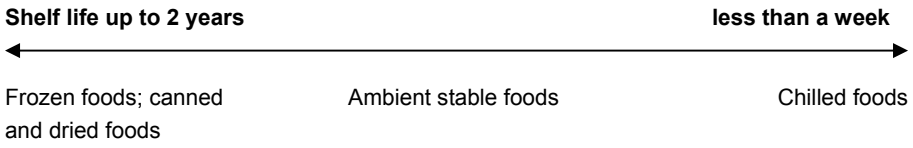

Figure 3

The point is that a variety of processes and packaging technologies are now available to the food producer, and these can be chosen to meet the desired attributes of the product, e.g. bacteriological status, natural flavour, physical state, quality, shelf life, convenience, appearance, lifestyle, cost, etc..

Frozen foods typically are not one-ingredient products, but consist of multiple components. A great variety of products are made and marketed as frozen food: vegetables, fish, meat-based products, raw and cooked meat. These are combined into ready-made meals, or so called meal-centres (meat with sauces, for example). To bring frozen foods to the customer requires an elaborate and expensive system of distribution that is able to keep the products at a stable temperature at all times, the so-called freeze chain.

The introduction of microwave technology in most households has complicated the life of frozen food makers. To ensure that a nice meal is ready in five minutes after putting a pack of frozen food in the microwave, requires a lot of thinking about nature, size and position of the components in the set meal. If the thickness of a beef slice or the size of a potato is not chosen well in relation to the other components of the meal, this will negatively affect the performance of the product in the microwave oven.

To produce and market frozen foods requires large and sophisticated organisations. Consequently, the market is supplied by a smallish number of large producers that compete on a very segmented market. A deep frozen curry can either be a simple and cheap product, or a complex one at three or four times the price.

5.8.2. The regulation of packaging sizes

There is no regulation of pack sizes in the case of frozen foods. Any prescription of volumes or weights for this sector would seriously interfere with the actual running of a business, as it typically consists of catering to changing consumer demands by offering complex products in a great and dynamic variety of quantities and sizes.

5.8.3. Market trends in pack sizes

An important change (for packaging sizes of frozen foods) in consumer habits is perceived to be that people tend not to buy in bulk as much as they used to do. The advent of the supermarket around the corner or within a short car ride probably helped bring that change about.

Perhaps even more important is that consumers nowadays cannot be stratified as they used to be by marketeers in A, B, C and D market segments according to their income

bracket. Lifestyles are perceived to have become more important determinants of consumer behaviour.

Products made for elderly people tend to be presented in smaller sizes than those for young people. More complex products aimed at health freaks at the upper levels of the market likewise are marketed in smaller portions at higher unit prices than simpler products for big appetites at the lower levels of the market. As pack size can act as a feature for differentiating the product, a typical producer of frozen food may end up with 500 different sizes and SKUs (stock keeping units).

A recent development is that of one serving portionable packages for ice cream gateaux.

5.8.4. Retailers, innovation and the costs of variation in pack sizes

It is the frozen food producers' business to know changing consumers' tastes and cater for them by ongoing product innovation. This means that there are product development processes going on at any point in time. Consumers are involved in these processes at the level of market research. Retailers participate in the dialogue about a new product. This is not so difficult to achieve, because, for example in the United Kingdom, 80 % of the turnover of frozen foods is realised through less than 10 retail chains. They have a penchant to ask for varying sizes for promotional action.

Because the product is complex and its chain of production and distribution too, the number of issues to be dealt with is large: production efficiency, cost of raw materials, energy consumption, transport and distribution issues. The decision on size is an outcome of the total cost equation as much as of marketing considerations. Varying pack sizes is costly, but in the case of the frozen food industry, it is one cost element amongst many. In general, in the frozen food industry, it is the product that determines the pack size.

5.9. Conclusion

What can we learn about pack sizes regulation and innovation from these five cases of consumer products' industries, each coping in its own way with a changing environment? Firstly, we see that the type of innovation involving changes in pack sizes in all but one of the cases, is product innovation. Second, we see that this product innovation consists of developing multi-component products that tend to be offered in one-portion servings, instead of 'in bulk'.

In none of the cases was the innovation hampered by the existing regulatory regime on pack sizes. In some cases this is so because there is no regulation (yoghurt). In other cases the regulation does not cover the categories of multi-component products (frozen foods) or one-portion servings (coffee) in which the innovation has taken place. In the case of soft drinks, product innovation has been realised within the context of a mandatory range of prescribed quantities. The one case where we did not see product innovation is wine. Here it appears that the existing mandatory range of pack sizes allows producers to serve their customers with all possible functions that their products may have, as one of our interviewees put it.

6. Conclusion

6.1. Overall conclusion

It is not possible to make a general, straightforward statement about the relationship between regulation of pack sizes and innovation in the packaging chain. Whether pack sizes regulation positively or negatively influences innovation, or has an impact at all on innovation, depends on the outcome of the interplay between numerous other factors.

We then saw innovation of various types in the packaging chain – product innovation (mostly based on new technologies, new available materials and changing consumer demand) and process innovation - in cases with varying regulatory frameworks.

In general, the more complex is the chain of processes to supply the (final) product or service to the customer, the more restrictive is the effect of prescribed quantities. This is not to say that to regulate or not to regulate pack sizes is a question of opting for more or less restriction of producer freedom to innovate and better serve the customer.

For simpler, 'semi-commodity' products ([68]), mandatory standardisation of sizes may introduce a measure of rigidity in the market which is actually beneficial for innovation. Such rigidity would preclude excessive use of resources for frequent pack size changes for promotional purposes in support of price competition (now offering you 10 % more of x for the same price), that eventually increases packaging costs. These costs will be duly transferred to the consumer without creating extra value. Somewhere along the line from simpler to more complex consumer products, the balance tips to the other side, innovation hampering restrictiveness becoming the dominant effect.

The actual effect of mandatory EU regulation concerning prescribed ranges of sizes on innovation varies according to:

- the type of product: for relatively simple, 'semi-commodity' products, mandatory standardisation of sizes may introduce a measure of rigidity in the market which may actually be beneficial for innovation;
- the current balance of power between different links in the chain: the absence of mandatory EU legislation enables other parties to enforce their demands concerning sizes allowed;
- the speed of changing consumer demand: sectors selling fast-moving consumer goods encounter problems with the current national ranges, not always allowing them to serve the consumer in the most optimal way (according to the manufacturer). They fear that harmonisation of mandatory ranges (instead of abandoning them altogether) might not provide the flexibility to accommodate future demands of consumers.

([68]) That is, single or few component products with short value added chains.

We saw that in all but one of the studied cases of one particular type of innovation involving packaging – i.e. product innovation consisting of the development of multi-component products that tend to be served in one-portion servings – pack size regulation did not apply. It would, however, be premature to conclude from this correlation that there is a positive relationship between the absence of regulation and innovation. A case in point is that of soft drinks in which product innovation is actually occurring in a context of mandatorily prescribed pack sizes. Such a regulatory context may in fact come close to full producer freedom in applying pack sizes as is illustrated by the wine case (cf. strategy A of paragraph 3.7.).

It follows that the two initial hypotheses (regulation does not hamper innovation/not regulating induces innovation) can only be answered on a case-by-case basis.
For methodological reasons we refrained from an effort to quantify the effect of regulation, as was provided for in the research plan. Firstly, we could not find an unambiguous relationship between pack size regulation and innovation in the packaging chain, implying that you may not generalise what we found in any of the cases. Secondly, to attribute the value added within a certain time frame by a particular product innovation to the packaging innovation involved and then to the presence or absence of pack size regulation, raises theoretical problems we could not solve within the framework of this research project.

6.2. Policy implications

What then, do these findings imply for the policy alternatives of the EC that were formulated in Chapter 3 of this report? Let us first have a closer look at those alternatives. At the end of Chapter 3 (paragraph 3.7.), the following regulatory alternatives have been presented.

- Harmonisation
- No harmonisation
  - (a) Liberalisation (no legal regulation about sizes)
  - (b) Standardisation
  - (c) Mandatory (some products) + standardisation or liberalisation (the rest)

These regulatory alternatives involve, essentially, three policy options.

Option 1: harmonise, i.e. adopt all existing national legislation for pack sizes, to introduce mandatory ranges for all products now regulated.

Option 2: abstain from all pack size regulation (in those cases where there is now regulation in place, this implies deregulation, in some cases, this option may induce self regulation by industry).

Option 3: harmonise the pack size regulation for some products and abstain from regulating the pack sizes of other products (again, this may in some cases imply liberalisation and lead to self regulation by industry, but not in others).

Even though the last option seems the most reasonable one, the results of our theoretical and empirical research do not support any general statement about the desirability of either harmonising the regulation on pack sizes with a view to stimulating innovation in the packaging chain or the abstention of such regulation.

We have come to believe that the product is the better starting point for the design of pack size regulation than packaging itself. It follows that the integration of pack size regulation in vertical or 'recipe' regulation was a better approach than its integration in a body of legislation addressing packaging in general.

6.3. Recommendations for follow-up research

The selection of option 3 also implies that any change in the regulatory regimes should be supported by in-depth research on a case-by-case basis. The questions to be asked in that research should include the following:

1. What needs to be achieved by (de)regulating pack sizes?
2. Are these objectives in line with accepted EC policy?
3. Can these be achieved by any other means?
4. What is the chance that the objectives will be met in the sector(s) to be (de)regulated and under what conditions?
5. What more would the EC need to do to realise these conditions?

Annex 1. National legislation concerning pre-packaging sizes

Finland

Directives 106/75/EEC, and 232/80/EEC are now implemented with the Ministry of Trade and Industry Decision on pre-packages n.179 of 2000. Annexes I to VI are one to one from the directives. In particular, Annexes III and IV to the mentioned Decision 179 of 2000, copy – respectively – Annex III to Directive 106/75/EEC and Annex I to Directive 232/80/EEC.

By reproducing the Directives, the Finnish legislation provides for mandatory values.

Greece

The basic terms of reference in carrying out Directives 106/75/EEC and 232/80/EEC are Ministerial Decision No F1-6909 of the 31 December 1985 (and subsequent modifications) for liquid foodstuffs; Ministerial Decision No F 968 of the 7 February 1989 (for non-liquid foodstuffs). All EC values are transposed in the national regulations.

There are also additional values:

Liquid foodstuffs (Annex III, Directive 75/106/EEC):
Wine (item 1.a):2
Spa waters, aerated waters, etc. (item 8.a): 1
Edible oils (item 6): 1

Non-liquid foodstuffs (Annex I, Directive 80/232/EEC):
Pasta products (item 1.5.2): 1

The above source regulations require all listed products to comply with the prescribed values before they are introduced into the Greek market.

All values transposed to Greek legislation are mandatory.

Italy

The basic term of reference in putting into practice Directives 106/75/EEC and 232/80/EEC are Legislative Decree 451/76 (liquid foodstuffs) and Presidential Decree 871/82, as amended, (non-liquid foodstuffs). There is also the Decree of the President of

the Republic 26/05/1980 No 391 whose Annexes I to III reproduces – without applying to 'EC pre-packages' – the values in Annexes I to III to Directive 80/232/EEC.

Italian legislation concerning liquid foodstuffs provides for 'pre-packaged EEC products', that is products complying with the provisions of the Decree mentioned above, to be liberally introduced in the Italian market. Annex I, however, provides for certain pre-packaged liquids to be introduced in the market exclusively if their nominal volume is provided for in the table. As for non-liquid foodstuffs, Annex III to Presidential Decree 871/82 provides for the introduction of products in the market exclusively in the nominal volumes or capacities envisaged.

The Decree of 29 July 1999 of the Ministry of Trade and Industry emends the Decree No 391 of 1980. Considering the Directive 98/6/EEC concerning the 'unit pricing', this Decree provides that certain products ([69]) can be marketed without referring to ranges of nominal quantity and capacities. So, all the provisions concerning ranges of quantity and capacity of non 'pre-packaged EEC products' are eliminated**.**

The Decree of 14 May 2001 of the Ministry of Trade and Industry emends the Decree No 391 of 1980. Considering the Directive 98/6/EEC concerning the 'unit pricing', this Decree provides that certain products ([70]) can be marketed without referring to ranges of nominal quantity and capacities. So, all the provisions concerning ranges of quantity and capacity of non 'pre-packaged EEC products' are eliminated.

Spain

The basic terms of reference in putting into practice Directives 106/75/EEC and 232/80/EEC are the Royal Decrees 1472/1989 of the 1 December 1989 (whose Attached Documents I and II provide for quantity ranges for liquid foodstuffs and non-liquid foodstuffs respectively) and 151/1994 of 4 February 1994 (which replaces Annex I to Royal Decree 1472/1989). The Royal Decree 1472/1989 has been amended by Royal Decree 1202/1999 of 9 July of 1999 and by Royal Decree 1194/2000 of 23 June 2000.

Spanish legislation, particularly Article 5 of Decree 1475/89 (as emended in 1994) prohibits the introduction into the Spanish market of products in predetermined quantity values other than those provided for in the said source regulations.

The Article 5 mentioned doesn't apply to products coming from Member States and coming from States which are parties of the European Free Trade Association and of the Treaty concerning European Economic Space ('Disposition addicional cuarta' introduced by the Decree of 1999).

([69]) Products are: cheese (items 1.2.1 and 1.2.2 , Annex I); cereals (item 1.5.4, Annex I); ice cream of more than 125 g (item 1.9); mayonnaise (item 2.1); dry food for dogs and cats (item 3); cleaning products (item 6, Annex I); soaps (items 8.1 – 8.6, Annex I); moist food for dogs and cats and cleaning products mentioned in Annex II) .
([70]) Products are: butter (items 1.1, Annex I); dried vegetables (item 1.6, Annex I); fruit and vegetables, pre-cooked potatoes for chips (item 1.8.1, Annex); fish fillets (item 1.8.2, Annex I); fish fingers (item 1.8.3, Annex I); solid or powered glues (item 5, Annex I); cosmetics (see items 7.1 – 7.6, Annex I); solvents (item 9, Annex I), lubricating (item 10, Annex I) .

The Royal Decree 1194 of 23 June 2000 provides for two new values (0.275 and 0.33 litres) not included for 'Vermouth' (item 1.d) and 'milk' (item 7) in Annex III to Directive 75/106/EEC.

The mentioned Decree also provides for new additional values for fruit and vegetables, pre-cooked potatoes (200 and 400 g) and for fish fingers (250, 400, 800 and 1 000 g) with a transitional period up to 31 December 2001.

Additional values are provided for as to:

a. Directive 75/106/EEC:
Vermouth, etc. (item 1.d, Annex III): 2 (0.15 and 0.275 litres, the last one by the Royal Decree of 2000)
Olive oils (item 6, Annex III):1 (2.5 litres in metal containers only)
Milk (item 7, Annex III): 2 (0.33 – by Royal Decree of 2000 – and 1.5 litres)
Water, etc.(item 8.a, Annex III): 4 (4, 5, 8 and 10 litres)
Lemonade, etc. (item 8.b, Annex III): 1 (3 litres)
Beverages labelled as alcohol free .(item 8.c, Annex III): 2 (0.15 and 0.20 litres)
Fruit or vegetable juices, etc. (item 9, Annex III):1 (0.150 litres)

b. Directive 80/232/EEC
b.1. Foodstuffs
Butter and margarine (item 1.1, Annex I): 1 (15 g)
Impalpable sugar, etc. (item 1.4): 2 (622 and 666 g)
Prepared cereals, etc. (item 1.5.4): 2 (200 and 300 g)
Roasted coffee, etc. (item 1.7): 1 (200 g)
Frozen products: fruit and vegetables, pre-cooked potatoes (item 1.8.1): 2 (200 and 400 g until 31 December 2001)
Fish fillets and portions, etc. (item 1.8.2): 1 (250 g)
Fish fingers (item 1.8.3): 1 (240 g) + 4 (250, 400, 800 and 1 000 g until 31 December 2001)

b.2 Non foodstuffs
Dry dog and cat food (item 3): 1 (4 000 g)
Hair care products (item 7.3): 1 (1 500 g)
Solid toilet, etc. (item 8.1): 5 (125, 450, 600, 800, and 1 200 g , the four last values only for multipack)
Washing liquid, cleaning products (item 8.4): 1 (2 500 ml)
Scouring powder (item 8.5): 1 (5 000 g)
Pre-wash and soaking products, etc. (item 8.6): 5 (75, 150, 3 000, 4 000, 5 000 g)

Defective transposition

Spanish legislation doesn't provide for the value of 15 ml for 'alcohol-based products' (item 7.4, Annex I to Directive 232/80).

Spanish legislation lays down provisions which, on certain conditions, restrict the use of certain EC quantity values.

- Pasta products (item 1.5.2 of Annex I to Directive 80/232/EEC): the relating values do not apply to fresh pasta.
- Ground or unground roasted coffee, chicory: the relating values do not apply to 'monodose' products.
- Fish fillets and portions, etc. (item 1.8.2 of Annex I to Directive 80/232/EEC): the relating values do not apply when the number of units appears on the container.

All EC quantity values are mandatory (including the additional ones).

United Kingdom

The basic terms of reference for putting into practice Directives 106/75/EEC and 232/80/EEC are the Weights and Measures (knitting yarns) Order 1988, the Weights and Measures (intoxicating liquor) Order 1988, which transposes all mandatory values of alcoholic drinks provided for in Annex III to Directive 75/106/EEC; the Weights and Measures (miscellaneous foods) Order 1988.

The mandatory nature of values is provided for in Article 4, Weights and Measures (Intoxicating Liquor) Order 1988 and Article 3, Weights and Measures (Miscellaneous foods) Order 1988.

All values provided for by English legislation are mandatory.

The U.K legislation provides for additional values with respect to those provided for in the directives

a. Directive 75/106/EEC, Annex III:
Spirits and other spirituous beverages: (item 4): 1
Milk (item 7): 7

b. Directive 80/232/EEC, Annex I
b.1 Foodstuffs
Butter and margarine (item 1.1): 9
Table and cooking salt (item 1.3): 11
Pasta products (item 1.5.2): 1
Prepared cereals, etc. (item 1.5.4): 4
Dried vegetables, etc. (item 1.6): 9
Roasted coffee (item 1.7): 16

State of art 1999 ([71])**:**

([71]) Amaducci Study of 1999.

Belgium

The basic term of reference in carrying out Directives 106/75/EEC and 232/80/EEC is the Royal Decree of 25 February 1982. The Decree transposes to Belgian regulations all the values provided for in the two directives with the following exceptions.

Additional values are provided for:

Liquid foodstuffs:
Beer: (item 3.a, Annex III to Directive 75/106/EEC): 6
Acid beer, gauze: (item 3.b, Annex III to Directive 75/106/EEC): 12
Milk: (item 7, Annex III to Directive 75/106/EEC): 9

Defective transposition

The Royal Decree of 11 January suspends the application of the values provided for by Directive 80/232/EEC for the following product categories: 'fresh cheese, etc' (item 1,2), 'solid or powdered glues and adhesives' (item 5), 'hair care products, etc' (item 8.4),and 'pre-wash, etc.' (item 8.6).
Article 3 of the Royal Decree of 25 February 1982 requests that no pre-packaged products listed in its Annex I to IV whose nominal quantity or capacity does not comply with the values provided for therein may be placed on the Belgian market.

All values transposed to Belgian legislation, including the additional ones, are mandatory.

Denmark

The basic terms of reference in carrying out Directives 106/75/EEC and 232/80/EEC are Decree No 835 of 9 December 1986 (coffee and chicory extract), No 54 of 27 January 1987 (cocoa, chocolate and similar products), MT No 3-88 of 6 April 1988 (knitting yarns) and No 461 of 21 June 1990 (wine, sparkling wine and spirits). The Circular of the Ministry of Industry of 24 February 1981 quotes identical values to those in the directive, with the following exceptions.

Defective transposition

The Circular omits the transposition of two quantity values concerning vermouth (item 1.d, Annex III to Directive 75/106/EEC).

The abovementioned Decrees and the Circular of the Ministry of Industry subject the introduction in the Danish market of the products listed to the observance of the prescribed values.

All values transposed to Danish legislation are mandatory.

Germany

The basic term of reference in carrying out Directives 106/75/EEC and 232/80/EEC is the regulation on pre-packages dated 8 March 1994.

Annex I to this regulation assimilates the EC values concerning liquid foodstuffs (Directive 106/75/ECC) and Annex II the EC values regarding knitting yarns (Directive 232/80/EEC).

German legislation provides for a series of additional values to those established:

a. by Directive 75/106/EEC:
Other non-sparkling fermented beverages (item 1.c, Annex III): 4
Vermouth (item 1.d, Annex III): 2
Other fermented sparkling drinks (item 2.b, Annex III): 1
Beer (item 3.a, Annex III): 1
Milk (item 7, Annex III): 8
Water (item 8.a, Annex III): 4
Lemonade (item 8.b, Annex III): 4
Fruit or vegetable juices (item 9, Annex III): 8

b. other foodstuffs:
Sugar: 11
Chocolate: 9
Cacao: 7

In Germany all values are mandatory.

France

The assimilation of the quantity ranges provided for at Community level together with the national additional values was made possible thanks to a vast number of special legislative mechanisms (each regulating one specific product category). Such prescriptive acts absorb the EC values with the exception of the following.

Additional values are provided for as to:

a. Directive 75/106/EEC, Annex III:
Yellow wines (item 1.b): 14
Cider Perry and mead, etc. (item 1.c): 2
Cider Perry and mead, fermented, sparkling (item 2.b): 3
Beer (item 3.a):1
Vinegar and substitutes (item 5,):1
Olive oils (item 6):2
Milk (item 7): 2
Water, etc.(item 8.a): 1

Lemonade, etc. (item 8.b): 1
Fruit or vegetable juices, etc.(item 9):3

b. Directive 80/232/EEC, Annex I
b.1. Foodstuffs
Butter and margarine (item 1.1): 2
Fresh cheeses, etc. (item 1.2): 7
Impalpable sugar, etc. (item 1.4): 5
Rice (item 1.5.3): 1
Prepared cereals, etc. (item 1.5.4): 1
Dried vegetables, etc. (item 1.6): 1
Frozen fruit, etc. (item 1.8.1): 8
Fish fillets and portions, etc. (item 1.8.2): 10
Fish fingers (item 1.8.3): 9
Ice cream (item 2.1): 5

b.2 Non foodstuffs
Dry dog and cat food (item 3): 2
Cleaning products (item 6): 2
Hair care products (item 7.3): 1
Alcohol-based products (item 7.4): 1
Solid toilet, etc. (item 8.1): 4
Soap in flakes:, chips, etc. (item 8.3): 2
Washing liquid, cleaning products (item 8.4): 1

On the basis of a standard clause inserted in all the above quoted regulatory acts, only pre-packaged products offered in nominal quantities as specified by these acts may be introduced on the French market.

All established values in the French regulations are mandatory.

Ireland

The basic terms of reference for putting into practice Directives 106/75/EEC and 232/80/EEC are the Merchandise Marks (Pre-packaged goods) Order, 1973, First Schedule, Parts I and II, as emended and the European Communities (Aerosol Dispensers and Pre-packaged goods) Regulations as emended. The quoted Irish legislation concerns only some of the products regulated by the two directives namely wine, sparkling wine, spirits, instant coffee, sugar, knitting yarns, beer, edible oils and milk. With reference to these products, the following was provided for.

Additional values are provided for as to:

a. Directive 75/106/EEC, Annex III:
Beer (item 3.a):4
Spirits and other spirituous beverages: (item 4): 1
Olive oils (item 6):8

Milk (item 7): 2

b. Directive 80/232/EEC, Annex I
b.1. Foodstuffs
Impalpable sugar, etc. (item 1.4): 1
Instant coffee (item 1.7):1

b.2 Non foodstuffs
Washing liquid, cleaning products (item 8.4): 2

Defective transposition

Milk (item 7): 1
Impalpable sugar, etc. (item 1.4): 1
Instant coffee (item 1.7): 1

Following the Directives' indications, Ireland has considered as mandatory all the values recommended as such. This compulsory nature has been extended to all the other products on which regulations have been passed (which are less in number than those provided for by the Directives).

The values for the few product categories provided for by Irish legislation are mandatory. As to all the other categories, in respect of which no transposition of EC values to national legislation has been made, the entrepreneur is totally free.

Luxembourg

The basic terms of reference for putting into practice Directives 106/75/EEC and 232/80/EEC are the Grand Ducal Regulation of 19 October 1977 (whose Annex II transposes the values in Annex III to Directive 75/106/EEC) as amended and the Grand Ducal Regulation of 26 November 1981(whose Annexes I, II, III transpose the corresponding Annexes to Directive 80/232/EEC).

The only quantity values admitted in the Luxembourg market are those provided for by the already mentioned terms which totally assimilate all EC values.

Luxembourg has assimilated both Directives making mandatory the relative values.

Netherlands

The transposition of Community legislation concerning 'quantity values' is taken care of by a series of sectional provisions issued by manufacture organisations delegated by the Minister concerned. Such regulations control the following products: wine, coffee, distilled drinks, beer, edible oils and fats and knitting yarns, with the following exceptions as to EC values.

Additional values are provided for as to:

a. Directive 75/106/EEC, Annex III:
Beer (item 3.a):5
Acid beers (item 3.b): 5

Defective transposition

A large number of values (concerning the other product categories covered by EU legislation) has not been transposed into the Dutch legislation.

The few values provided for by Dutch legislation are mandatory.

Austria

The basic term of reference in putting into practice Directives 106/75/EEC and 232/80/EEC is the regulation of the Federal Minister for Economic Affairs on pre-packages. With regard to quantity values, these are transposed in Annex III (liquid foodstuffs), Annex IV (non-liquid foodstuffs) and Annex V (container capacities). With regard to EC values the following variations apply.

Additional values are provided for as to:
a. to Directive 75/106/EEC, Annex III:
Cider Perry and mead, etc. (item 1.c): 2
Vermouth, etc. (item 1.d): 2
Cider Perry and mead, fermented, sparkling (item 2.b): 3
Acid beer, gauze (item 3.b): 1
Olive oils (item 6):2
Milk (item 7): 2
Water, etc.(item 8.a): 1
Lemonade, etc. (item 8.b): 5
Fruit or vegetable juices, etc. (item 9):1

b. to Directive 80/232/EEC, Annex I
b.1 Non foodstuffs
Solid toilet, etc. (item 8.1): 1
Soft soap (item 8.2): 9
Soap in flakes:, chips, etc. (item 8.3): 8
Washing liquid, cleaning products (item 8.4): 3

Defective transposition
Annex 4 to FPVO 1993 wrongly comprises two EC values concerning ‘soft soap’ (item 8.2 of Annex I to Directive 80/232/EEC) and three EC values concerning the category ‘soap in flakes’ (item 8.3).

There is no transposition of EC values for many product categories, particularly for the following foodstuffs: butter and margarine (item 1.1): fresh cheeses, etc. (item 1.2), table and cooking salt (item 1.3), cereals, etc. (item 1.5.4), dried vegetables, etc. (item 1.6), frozen products, etc. (item 1.8.1), ice cream (item 2.1); for non-foodstuffs: dry dog and cat food (item 3), ready-to-use varnishes (item 4), solid and poured glues and adhesives (item 5), cleaning products (item 6), scouring powder (item 8.5), pre-wash and soaking products (item 8.6), lubricating oil (item 10).

All values assimilated in the Austrian legislation are mandatory.

Portugal

The basic term of reference for putting into practice Directives 106/75/EEC and 232/80/EEC is Order No 359/94 whose Annexes I to IV reproduce respectively EC values for non-liquid foodstuffs, container capacities, volumes of aerosols and liquid foodstuffs, with the following exceptions.

Additional values are provided for as to:

Spirits and other spirituous beverages (item 4): 1

Defective transposition

A value in the category 'impalpable sugars, etc.', has been omitted, another value in the category 'wines, etc.' (item 1.a), and another one in the category 'spirits and other spirituous beverages' (item 4).

Most values assimilated in Portuguese legislation figure as 'recommended'. The mandatory values provided for by EU legislation are likewise mandatory.

Sweden

The terms of reference for putting into practice Directives 106/75/EEC and 232/80/EEC are the ordinance of the technical accreditation authority of 6 December 1993 on the EEC marking of pre-packaged goods and ordinance of the technical accreditation authority of 9 June 1994 on the pre-packaging of goods by volume or mass.

There are no additional national values.

Defective transposition

All values concerning 'fruit juices, etc.' (item 9 of Annex III to Directive 75/106/EEC) are omitted in national legislation. Only one value is omitted in the 'knitting yarns' category.

Swedish legislation provides for the same mandatory values (except for one value for 'knitting yarns') and the same optional values as in the directives.

Annex 2. CFR standard sizes

27 CFR 4.71 Standard wine containers

(a) A standard wine container shall be made, formed and filled to meet the following specifications:

(1) Design. It shall be so made and formed as not to mislead the purchaser. Wine containers shall be held (irrespective of the correctness of the net contents specified on the label) to be so made and formed as to mislead the purchaser if the actual capacity is substantially less than the apparent capacity upon visual examination under ordinary conditions of purchase or use; and

(2) Fill. It shall be so filled as to contain the quantity of wine specified in one of the standards of fill prescribed in Section 4.72 or 4.73; and

(3) Headspace. It shall be made and filled so as to have a headspace not in excess of 6 % of its total capacity after closure if the net content of the container is 187 millilitres or more, and a headspace not in excess of 10 % of such capacity in the case of all other containers.

27 CFR 4.73 Metric standards of fill [for wine]

(a) Authorised standards of fill. The standards of fill for wine are the following:

3 litres.
1.5 litres.
1 litre.
750 millilitres.
500 millilitres.
375 millilitres.
187 millilitres.
100 millilitres.
50 millilitres.

(b) Sizes larger than 3 litres. Wine may be bottled or packed in containers of 4 litres or larger if the containers are filled and labelled in quantities of even litres (4 litres, 5 litres, 6 litres, etc.).

(c) Tolerances. The tolerances in fill are the same as are allowed by Section 4.37 with respect to statement of net contents on labels.

Section 5.46 Standard liquor bottles

(a) General. A standard liquor bottle shall be one so made and formed, and so filled, as not to mislead the purchaser. An individual carton or other container of a bottle shall not be so designed as to mislead purchasers as to the size of the bottles.

(b) Headspace. A liquor bottle of a capacity of 200 millilitres or more shall be held to be so filled as to mislead the purchaser if it has a headspace in excess of 8 % of the total capacity of the bottle after closure.
(c) Design. A liquor bottle shall be held (irrespective of the correctness of the stated net contents) to be so made and formed as to mislead the purchaser, if its actual capacity is substantially less than the capacity it appears to have upon visual examination under ordinary conditions of purchase or use.

(d) Exceptions — (1) Distinctive liquor bottles. The headspace and design requirements in paragraphs (b) and (c) of this section do not apply to liquor bottles that are specifically exempted by the appropriate ATF officer, pursuant to an application filed by the bottler or importer.

(2) Cross reference. For procedures regarding the issuance, denial and revocation of distinctive liquor bottle approvals, as well as appeal procedures, see part 13 of this chapter.

27 CFR 5.47a Metric standards of fill (distilled spirits bottled after 31 December 1979)
(a) Authorised standards of fill. The standards of fill for distilled spirits are the following:

(1) For containers other than cans described in paragraph (a)(2), of paragraph XXX
1.75 litres
1.00 litre
750 millilitres
500 millilitres (authorised for bottling until 30 June 1989)
375 millilitres
200 millilitres
100 millilitres
50 millilitres

(2) For metal containers which have the general shape and design of a can, which have a closure which is an integral part of the container, and which cannot be readily reclosed after opening
355 millilitres
200 millilitres
100 millilitres
50 millilitres

(b) Tolerances. The following tolerances shall be allowed.

(1) Discrepancies due to errors in measuring which occur in filling conducted in compliance with good commercial practice.

(2) Discrepancies due to differences in the capacity of bottles, resulting solely from unavoidable difficulties in manufacturing such bottles to a uniform capacity, provided that no greater tolerance shall be allowed in the case of bottles which, because of their design, cannot be made of

approximately uniform capacity than shall be allowed in case of bottles which can be manufactured so as to be of approximately uniform capacity.

(3) Discrepancies in measure due to differences in atmospheric conditions in various places and which unavoidably result from the ordinary and customary exposure of alcoholic beverages in bottles to evaporation. The reasonableness of discrepancies under this paragraph shall be determined on the facts in each case.

(c) Unreasonable shortages. Unreasonable shortages in certain of the bottles in any shipment shall not be compensated by overages in other bottles in the same shipment.

(d) Distilled spirits bottled before 1 January 1980. Distilled spirits bottled domestically before 1 January 1980, may be marketed after 31 December 1979, if such distilled spirits were bottled in accordance with Section 5.47. (See Section 5.53 for similar provisions relating to distilled spirits imported in original containers.)