BACKGROUND REPORT SECOND AHWG-MEETING

EU ECO-LABEL FOR SHAMPOO AND SOAPS

BACKGROUND REPORT

PREPARED FOR THE SECOND AHWG-MEETING FOR THE DEVELOPMENT OF CRITERIA FOR SOAPS AND SHAMPOOS.

TIME: WEDNESDAY 16 MARCH 10.00-17.00.
PLACE: 5 AVENUE DE BEAULIEU, BRUSSELS

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The Flower makes it easy to choose green

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THE EUROPEAN ECO-LABEL- THE FLOWER

**The Flower is the symbol of the European Eco-label –
your guide to greener products and services.**

It is a VOLUNTARY scheme designed to encourage businesses to market products and services that are kinder to the environment and for European consumers - including public and private purchasers - to easily identify them.

You can find the Flower throughout the European Union as well as in Norway, Liechtenstein and Iceland. The European Eco-label is part of a broader strategy aimed at promoting sustainable consumption and production.

Key aims

- **to achieve significant environmental improvements** - by developing, publishing and promoting criteria that push the market forward, in order to minimise the environmental impacts of a wide range of products and services over their whole life-cycle;
- **to ensure the credibility of the award** – by efficient administration and through criteria which:
    - are environmentally strong;
    - are based on good science, including the precautionary principle;
    - take account of consumer health;
    - require good product performance;
    - are developed transparently and cost-effectively, with the participation of stakeholders;
    - are reasonably attainable;
    - are up to date.
- **to encourage manufacturers, retailers and service providers to apply for the award**, to publicise their own participation in the scheme, and to promote the availability of eco-labelled products and information about them;
- **to encourage purchasers to buy products and services with the award;**
- **to improve consumer awareness and behaviour** regarding the environmentally optimal use of products and services

How the eco-labelling Scheme works

It takes hard work and commitment to set up criteria. Every product group is designed and crafted to meet high environmental and performance standards. Ecological criteria for each product are defined on the basis of life cycle considerations (LCC) taken from a "cradle-to-grave" view of the environmental impacts of a product group.

How Eco-label Criteria are developed and adopted

Proposals for the definition of product groups and ecological criteria are made either on the request of the EUEB or by the Commission. The Commission gives a mandate to the EUEB (lead Competent Body) to develop or review the eco-label criteria. Priority product groups will be listed in the joint working plan. On the basis of these mandates the appropriate EUEB member, supported by a working group and the Commission will draft appropriate eco-label criteria and the assessment and verification requirements related to these criteria. All interested parties are invited to participate in this process. The Competent Body will take into account the results of feasibility and market studies, life cycle considerations and an improvement analysis. A regular feed-back process to the whole EUEB is ensured. Finalised criteria are submitted to the Regulatory Committee of national authorities and voted upon. If the Committee takes a favourable view of the proposal, the Commission proceeds with its adoption and publication. Otherwise, the Committee submits the proposal to the Council of Ministers for decision.

More information: http://europa.eu.int/comm/environment/ecolabel/index_en.htm

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1 Background

Ecolabelling Norway is Lead Country for the development of ecolabelling criteria for soaps and shampoos.

Ecolabelling Norway has, based on investigations made by us and others, as well as discussions in the ad-Hoc Working Group 8 November 2004, proposed a set of ecolabelling requirements. The criteria proposal is given in a separate document. This document contains:

a) a summary of investigations made since the first aHWG meeting
b) a summary of external studies of environmental and health effects of soaps and shampoos, not mentioned in the background document of the first meeting.
c) background for the requirement proposed
d) updates on PVC, anaerobic degradation and other disputed topics

The product group now encompasses the following rinse-off products:

a) liquid and solid soaps
b) shampoos
c) conditioners
d) shower products
e) any combinations of the above mentioned products
f) other rinse-off products (solid, liquid or gel) for cleaning human body and hair
g) consumer products as well as I´n´I-products

For the sake of simplicity we will later in this document use the simplified term "soaps and shampoos" while referring to all these products.

2 Introduction

Soaps, shampoos, shower products and conditioners are in the forefront of people's attention. It is the product category with highest turnover in Norwegian grocery stores. These products also feature prominently in advertising of all sorts, especially TV. The products are used daily by almost all Europeans and they are very closely linked to appearance and hygiene.

Ecolabelling Norway has contacted the manufacturers of these products and the manufacturers of the ingredients. Environmental organisations, consumer organisations, test institutes and government agencies have also been contacted.

Many manufacturers have expressed a wish to be informed about the project. COLIPA, the main manufacturers organisation have organised a committee to follow our work. Very few manufacturers have expressed a negative attitude towards the project, but it has been difficult to get the information or comments on our initial proposals.
With the exception of a few small- and medium-sized manufacturers we have been met with a neutral and passive attitude. Generally the small-

and medium-sized manufacturers have been more positive, some of them expressing interest in obtaining an eco-label on their products. The organisation of small- and medium sized enterprises (UEAPME) have supported and encouraged our work.

Our impression is that companies that produce both cosmetic products and household detergents express more interest in environmental issues. This can be seen by their environmental policy and openness regarding environmental impact. This is only to be expected because these companies have had to take the environmental issues into consideration because of the legislation on household detergents. Companies that are more purely cosmetic product manufacturers communicate very little on environmental issues. The reason for this could be that these companies have been concentrating on fulfilling the requirements of the Cosmetics Directive.

3 Reasons for ecolabelling of soaps and shampoos

Ecolabelling Norway has further studied the evidence or indications on the environmental and health impacts of soaps and shampoos.

There seems to be a popular belief that because these products are proven as "safe" products, i.e. not harmful to human beings, they must also have little impact on the environment. Household detergents, on the other hand, are more irritant and "harsh" products hence are regarded as harmful to the environment. Ecolabelling Norway have not found scientific evidence to support the notion that household detergents are more harmful to the environment than cosmetic products. On the contrary we have found indications that soaps and shampoos may have a high environmental impact. Some ingredients, such as Zinc Pyrithione (active ingredient in some anti-dandruff shampoos), have a low health impact but a high environmental impact. Additionally soaps and shampoos contain almost exclusively organic ingredients. Organic ingredients are more prone to bioaccumulate in organisms than inorganic ingredients because of their generally higher lipofilicity (which indicates higher solubility in fats). Finally the number of ingredients is far higher in soap and shampoos than in household detergents. More importantly the number of ingredients for which no environmental information (biodegradation, toxicity and bioaccumulation) is available seems to be much higher for soaps and shampoos. Without knowing the data of the ingredients the manufacturers have less possibility of reducing the environmental impact of the products.

As mentioned in this report and the background report of the first meeting, soaps and shampoos give rise to a number of negative environmental impacts. Some global impacts, like greenhouse gas emissions, are easy to quantify. Other impacts, such as the impact on water quality and biodiversity are more difficult to quantify. It is precisely these local and regional effect that ecolabelling have the highest potential to influence: water quality in rivers, lakes and oceans.

The major environmental problems in European surface waters are microbiological pollution, nitrates pollution, toxins and heavy metals. The

problems are unevenly distributed over Europe. For instance microbiological pollution is worse in Eastern Europe while Western Europe suffers from nitrate pollution. Eutrophication is a big problem in large parts of Europe. The situation is generally improving due to better wastewater treatment and increased number of households connected to treatment plants. While we cannot link these problems to soaps and shampoos, it is likely that already polluted water bodies will be vulnerable to further pollution, f ex from soaps and shampoos. It is very difficult (in practise impossible) to assess the impact of soaps and shampoo ingredients on European water bodies, but it is clear that many ingredients are quite toxic. It is not improbable that soaps and shampoo ingredients have a considerable effect on water bodies already weakened by other major pollutants.

The focus in pollution policy across the world has changed from dilution to prevention. Hence it makes more sense to reduce the toxic impact of soaps and shampoos rather than just hoping that the ingredients will be degraded and diluted until they cause no significant damage.

The non-degraded remains of soaps and shampoos end up in water recipients, in the sludge in wastewater treatment plant and in sediments. Many of the ingredients used are toxic and might then cause significant toxic effects on different organisms, even though the effects are difficult to quantify. Furthermore it is difficult to determine synergy effects between different ingredients.

The packaging ends up as waste after use
Although increasing amounts of waste is burnt (18 % in Western Europe) or recycled (29 % of the "old" EU) the major part of European waste is still landfilled (57 % in Western Europe). We should have this in mind when setting requirements on packaging.

Packaging consists mainly of plastic bottles (primary packaging), cardboard (secondary packaging) and pallets + shrink film (tertiary packaging). Pallets are re-used many times.

Primary packaging largely consists of plastics. The major plastics are polyethylene (PE), Polypropylene (PP) and Polystyrene. Polyethylene terephtalate (PET) and Polyvinyl Chloride (PVC) are used to a lesser extent. None of these materials are biologically degradable and hence will last "for ever" if landfilled. It is technically possible to make some plastics biodegradable by adding chemicals. The problem is that these materials cannot be recycled and they make recycling of ordinary plastics impossible if mixed together.

Packaging plastics are not only made of polymers. They also contain additives. PE and PP often contain pigments whereas PVC contains UV stabilisers. The additives are smaller molecules than the polymer itself and may migrate. The migration of additives has not been much studied with the exception of plastics for use with foods, e.g. food wrappings.

While recycling is clearly the most sustainable solution for packaging waste, we have to look at the realities today when setting requirements.

4 Market

Ecolabelling Norway have contacted a number of manufacturers (small, medium-sized and large) and manufacturers organisations but we have been able to find little more data on the market since the initial study. We would especially like to have data from the new Member States.

The consumption of these products in Western Europe is large. Ecolabelling have calculated a total consumption of approx. 1 million tons in Western Europe. This figure is based on sales figures and on some basic assumptions, f ex the percentage constituted by shampoos and conditioners of the total hair care products market.

The total market of cosmetic in the 25 EU-countries is 2 million tons based on an average daily consumption of 12 grams and a population of 456 million. Approximately half of this is volume is assumed to be water.

There are a number of other cleaning products on the market in addition to traditional soaps, shampoos and shower products. Peeling products and products for cleaning specific parts of the body are examples. We have not succeeded in obtaining sales figures specific for these special product groups.

As mentioned earlier in this report, a number of small- and medium-sized manufacturers are interested in obtaining the ecolabel for their products, especially I´n´I-products or products aimed at children and babies.

However, few manufacturers will take the initiative themselves to get the ecolabel. They will get the label if the market wants it. Hence it is very important to stimulate market demand, e.g. by informing procurers on their possibility, and duty, to take the environment into consideration when buying such products.

5 Legislation

The Cosmetics Directive does not take environmental issues into consideration and there are few signs that this will change in the near future. This fact has often been criticised. There are few signs that this situation might change. The last technical updates of the Directive only concern health aspects.

Some Countries wants to change this situation. The Norwegian Government has in its proposal for a new law on cosmetics called for an integration of environmental considerations into the Cosmetics Directive. In the background document sent with the law on public consultation they cite the example of Triclosan, which has been found to be harmful to the environment but still used extensively in cosmetic products.

The Swedish Government has contemplated producing an "observation list" of some ingredients found in cosmetic products. The criteria for inclusion on the list are that the compounds have such properties that the government wants to limits their use but have no way of doing that using the existing legislation.

This indicates that ecolabelling might serve a very useful purpose as a tool for consumers who want to buy products not only "safe" for human health but also for the environment. It could also help manufacturers to reduce the environmental impact of their production.

6 Studies on soap and shampoos

This chapter does not contain all the studies we have on soaps and shampoos. Some studies have not been mentioned because they have already been quoted in the first Background Report (distributed before the first aHWG-meeting). This report only mentions the studies we have been made aware of since the first meeting.

6.1 Studies by other agencies

Medical Products Agency in Sweden

The Swedish Medical Products Agency has made an Official study on the environmental effects of cosmetic products and medicines on behalf of the Swedish Government. Of the 7000 ingredients found in cosmetic products some groups of ingredients were singled out as giving the worst environmental impact. The basis was some selected indicators (volume of use, toxicity, etc). A risk analysis of a few selected groups of ingredients and assessment of some known or suspected environmentally harmful ingredients was made.

The findings of the report were:
Cocoamidopropyl betaine and Parabenes were found to pose little or no risk to the aquatic environment. Bronopol pose a potential risk but only when the total usage was considered (also usage in other products). Cetrimonium salts pose a slight risk whereas Sodium Laureth Sulphate and Triclosan pose a high risk.

The following ingredients were found to be environmentally harmful: Butyl metoxydibenzoylmethane, EDTA, Cocoamide DEA, Isoparaffines, Polyquaternium-10, Resorcinol, Zink oxide and Zink Pyrithione. Sodium Lauryl Sulphate was evaluated as not harmful to the environment:

The main recommendations from that study were:

- Environmental Regulations should be taken more into account in the Cosmetics Directive.
- More, and better, risk assessments should be made.
- The knowledge base on potential environmental risks of cosmetic products should be increased.
- The reporting of product content should be improved and the flows of ingredients better supervised.

- More information should be made available in order to stimulate the environmental awareness.

Report for the Swedish drinking water provider Stockholm Vatten
The student Kristina Johansson has made a study of the environmental effects of hair care products on behalf of Stockholm Vatten. She studied 73 products. 21 ingredients were found to be, while another 40 were suspected to be, harmful to the environment. Some ingredients could not be identified and a great number lacked environmental information. The study showed that hair colouring products contained most of the environmentally harmful ingredients but many were found in shampoos and conditioners too.

Environmentally harmful ingredients found in shampoos and conditioners were: Ammonium hydroxide, Behentrimonium chloride, cetrimonium chloride, diazolidinyl urea, diethyl dimonium chloride, disodium lureth sulfosuccinate, distearyldimonium chloride, isothiazolinones (MIT and CMI) and thymol. Carbomer, some polyquaternium-compounds (2-, 4-, 6-, 7, 10-, 11-, 30- and 37-), quaternium-52 and some silicone oils and some colours were suspected of being harmful to the environment.

Conclusions:
- The environmental impact have been studied for a large number of ingredients
- Most environmentally harmful compounds were found in shampoos and colouring products
- Many ingredients are suspected to be harmful to the environment
- Some products are inadequately labelled.

Report commissioned by the Swedish County Jönköping
The study was called "Environmental impact of hygiene products". Risk assessments of selected ingredients was used. The product groups liquid soaps, shampoos, conditioners and toothpaste were studied and three different water scenarios used: single separate releases, wastewater from a treatment plant and one river. The report found risk quotas of > 1 (this indicates an environmental risk) for quarternary ammonium compounds, cocoamido propyl betaine, triclosan, sodium cocoamphoacetate, sodium lauryl ether sulphate and cocoamide DEA. The last ingredient were found to cause a low risk when used only in the studied products but a high risk when considering the total usage.
Parabenes were prioritised for risk assessment but could not be studied because of lack of information.

6.2 Studies by Ecolabelling Norway

Ecolabelling Norway has studied more than 111 products. These products were selected from North European markets. Both I´n´I-products (products for Institutional and Industrial use) and consumer products were represented.

Ecolabelling Norway has made:

- a quantitative study of 50 products based on their exact formulations.
- a semi-quantitative study of 61 products for which we only had ingredients list.
- quantitative comparison with household detergents

Quantitative studies of 50 products based on exact formulations
Based on the quantitative study we have calculated some parameters to get an impression of the total environmental impact.

The CDV gives a measure of the total toxic impact of the product. The parameter is described in detail later in this report.

Table 1. Average chronic CDV

Product group	CDV (l/g AC)
All products	9300
Shampoos	8300
Liquid soaps	10700
Solid soaps	2200
Conditioners	16000
Shower products	9200

A large percentage of the CDV is taken by 3 ingredients: Cocoamidopropyl betaine, lauryl ether sulphate and perfume. Cocoamidopropyl betaine alone accounts for 50-80 % in most of the products where it is used. Lauryl ether sulphate typically accounts for 20-40 % of the CDV. Perfume typically accounts for 5-15 % of the CDV but the figure can be much higher, especially in products without cocoamidopropylbetaine or lauryl ether sulphate.

Our studies reveal that many products contain ingredients that have this combination of high toxicity and low biodegradability. Additionally many ingredients are not documented. Based on reports and expert opinions we evaluated the toxicity, biodegradability and (in some cases) the bioaccumulation potential of many of these ingredients without environmental data

We have not been able to find environmental data for roughly 10 % of the ingredients in the investigated products, either because the ingredients have not been tested or because we did not have access to the data.

The following table show the amounts of classified ingredients found in the quantitative study of 50 compounds.

Table 2. Average content of classified ingredients

Product group	R50/53	R51/53	R52/53	R50
All products (mg/g AC)	12	16	10	450

The Directive on Dangerous Preparations does not cover cosmetic products. It is however interesting to check how many of the studied products would have been classified as harmful to the environment if the Directive on Dangerous Preparations did apply to Cosmetics.

We have only taken into account the combined risk phrases, not the risk phrases that only concern degradability/bioaccumulation or only toxicity. The reason for this is that there are other requirements that limits the toxic impact (CDV) and degradability (limit on not degradable surfactants).

The symbol ´N´ means that the product should bear a symbol, in this case a dead tree. If the product would classify for the risk phrases R50/53 or R51/53 the risk phrase and the symbol would have to be printed on the label. If the product would classify for the risk phrase R52/53 only the risk phrase would have to be printed on the label.

N, R50/53: $(W_{R50/53}/25\ \%) \geq 1$
N, R51/53: $((W_{R50/53}/2{,}5\ \%)+(W_{R51/53}/25\ \%) \geq 1$
R52/53: $((W_{R50/53}/0{,}25\ \%)+W_{R51/53}/2{,}5\ \%)+W_{R52/53}/25\ \%)) \geq 1$

$W_{R50/53}$ = Weight percent of ingredients that may be classified as R50/53.
$W_{R51/53}$ = Weight percent of ingredients that may be classified as R51/53.
$W_{R52/53}$ = Weight percent of ingredients that may be classified as R52/53.

Our studies indicated that no products would get the risk phrases R50/53 or R51/53. 6 products would get the risk phrase R52/53 whereas 5 products would be close to the classification limits. This means that 10 % of the products could be classified as harmful to the environment according to the combined risk phrases alone. However 5 of these 6 products are conditioners.

We generally wish to encourage the use of biodegradable ingredients. Compounds that are not biodegradable may accumulate in the environment and are a potential environmental risk. Our investigation shows:

- Generally < 20 mg/g AC ingredients not readily biodegradable (OECD 301 A-F)
- Generally < 50 mg/g AC ingredients not anaerobically degradable (OECD 11734)
- Conditioners contain far more compounds with reduced biodegradability.
- Biological additives such as “aloe vera gel” are generally not tested

AC means active content defined as the sum of organic ingredients.

Low biodegradability may not be a problem if the toxicity is low. In combined parameters such as the CDV or the risk phrases (R50/53, etc) this has been taken into account. Hence it is of interest to see how large fraction of the anaerobically not degradable ingredients that have a high toxicity.

Table 3. Amount of ingredients not anaerobically degradable (NAD) [mg/g AC]

Product group	NAD	NAD and Toxicity < 100 mg/l	NAD and Toxicity < 10 mg/l
All products	18	13	10

Endocrine disrupters
No ingredients on the EU-list of endocrine disrupters were found. Neither were the two suspected endocrine disrupters benzophenone and butylparaben (not on the EU list) found in the products.

Semi-quantitative studies of 61 products based on ingredients list
The 61 products are 19 shower products, 7 solid soaps, 10 liquid soaps, 19 shampoos and 6 conditioners. The products contain 250 ingredients. From different sources we found environmental data or evaluations of environmental properties on 68 % of the ingredients. We searched for environmental data in various sources. Some confidential data has been made available to us but most of the data was found in open sources, such as the DID-list. We have no data on biodegradability, bioaccumulation or aquatic toxicity for 32 % of the ingredients.

31 % of the product contained preservation agents that release formaldehyde upon degradation.

None of the endocrine disrupters on the EU-list were found in the products. 5 % of the products contained the suspected endocrine disrupters benzophenone and butylparaben.

Almost half the products (43 %) contained "biological additives" (e.g. plant extracts.

Comparison with household detergents.
In order to get an understanding of the environmental impact of soaps and shampoos, a comparison was made with all purpose cleaners and laundry detergents. The same functional unit as proposed for soaps and shampoos was used.

The all-purpose cleaners have CDVs from 18000 to 30000 l/g AC. The Laundry detergents have CDV from 2500 to 5000 l/g AC.

The content of anaerobically degradable ingredients was 70-190 mg/g AC (laundry detergents) and 60-300 mg/g AC (all-purpose cleaners).

None of the studied products classified for labelling as environmentally harmful.

This study was made on the basis of a few products with the purpose of getting an idea of the magnitude of potential environmental impact of soaps and shampoos compared to household detergents.

Generally we can say that the potential environmental impact of soaps and shampoos are of the same magnitude as that of household detergents.

Other studies
Manufacturers, experts and test institutes have been asked about test for mildness and efficiency. There exist tests for these parameters but no standard tests. The test institutes and manufacturers are reluctant to give us their test methods. They have invested in the test methods and are not interested in publishing them for free.

7 Definition of the product group

The aHWG has agreed that only rinse-of products for human use should be included. It can be discussed whether or not conditioners are "rinse-off" products but they require a rinsing off with water after application and they have a low retention (<1 %). Soaps, shower products and shampoos have many similarities but conditioners are quite different in composition. However conditioners are often mixed with shampoos in products and the biggest potential environmental benefit seems to be for conditioners.

There exist many "niche" products f. ex. washing gels for the face, hand cleansing gels and peeling product containing abrasives.

The manufacturers we have contacted have not been willing to give us the information we need to evaluate whether these products should be included in the product group. The COLIPA frame formulations indicate that these products contains many of the same products that are found in traditional shampoos, soaps, shower products and conditioners. The fact that we have no exact frame formulations means we cannot make a quantitative analysis of the products. Hence we cannot know whether or not the product will qualify for the ecolabel.

We propose a broad definition covering all products for regular cleaning of human body and hair as well as conditioners.

Proposal
The product group contains liquid, solid and gel-formed cosmetic (see the EU Cosmetics Directive 76/768/EEC with adaptations) rinse-off products used primarily used for cleaning and washing human skin and hair. Liquid and gel-formed rinse-off products for conditioning hair are also included.

8 Functional unit

For the purpose of risk assessments COLIPA has determined different standard. The surface areas of the body and different body parts have been set. Standard doses and standard use frequency for different products also exist.

Hair conditioner:	Dosage 14 g and use frequency 1-2 times a week.
Shampoo:	Dosage 12 g and use frequency 2-7 times a week.

Shower gel: Dosage 5 g and use frequency 1-2 times a day.
Soap bar: Dosage 0,8 g and use frequency 3-6 times a day.

The retention of these products are all estimated at < 1 %.

Similarly standard measures for the area of the whole body and individual body parts exist.

We have received a proposal that the functional dosage should be set equal to these standard dosages. This is a good proposal because it links the environmental effect to the typical dosage actually applied. However we could risk that products are diluted until the requirements are met. Ideally the functional unit should be linked to a certain task that could be accurately measured. Then a dosage could be accurately defined and specified on the label. According to our knowledge no such test exists.

We propose to set the functional unit to 1 gram of organic ingredients. This solves the problem of diluting the product with water or inorganic ingredients and it is very easy to calculate precisely. Furthermore, no test is required.

Not all proposed parameters are linked to this functional unit. The requirement on environmental risk phrases is based on percentage of the whole product because it is specified like that in the Dangerous Preparations Directive. The parameter on packaging weight is based on weight of the whole product, not just active content. This is explained later in this report.

Proposal
The quantitative parameters should be based on the weight of organic ingredients. The functional unit is 1 g organic ingredients.
Rubbing/abrasive agents in hand cleaning agents are not included.

9 Proposed requirements

The LCAs, risk analysis and other studies show that soaps and shampoos cause a variety of negative environmental impacts. Some of these impacts are directly linked to the product e.g. raw material extraction + refining, ingredients manufacture, product manufacture, impact during use and impact after use of the products. Some impacts are indirectly linked, e.g. use of energy for heating washing water in the use phase. Environmental impact includes greenhouse gas emissions, ozon layer destruction, formation of photochemical oxidants, depletion of non-renewable resources, acidification, eutrophication, reduction of water quality, loss of biodiversity and various health effects such as allergies.

The consumption of these products in Western Europe is large, approx. 1 million tons in Western Europe. The environmental effects are potentially large, but not all environmental effects can be addressed by ecolabelling. Rather ecolabelling is one "environmental policy tool" that should be used alongside others, e.g. regulations, information campaigns, green taxes and voluntary agreements.

Experience from ecolabelling of household detergents, the product groups most similar to soap, have shown that it is difficult to set requirements on the first life phases: Raw material extraction/refining and manufacture of ingredients. Is it difficult to get sufficient information to set the requirements but more problematic: It is very difficult to compare the environmental effects of ingredients derived from plants and petroleum. Some effects are caused by both sources (e.g. depletion of non-renewable resources, greenhouse gas emissions, acidification, ozone layer depletion) whereas others are specific to one source.

Plant sourced ingredients cause f.ex. land degradation, loss of biodiversity and effects of pesticide use.

Petroleum sourced ingredients cause f.ex. local effects of pollution from oil drilling and refining, oil spill effects, etc.

Experience have shown that ecolabelling is most efficient in reducing the environmental impact of soaps and shampoos after use and, to a lesser extent the health effects during use. This is done by regulating the inherent properties of the ingredients of the products and the packaging weight and material.

9.1 Requirements on raw materials.

Because of the following difficulties we have decided (with one exception) not to propose any requirements relating the first life phases of the products:

a) Difficulties in getting adequate quantitative information about the production of ingredients and
b) Difficulty in comparing very different environmental impacts

Palm oil is mostly used in food but it is also used as raw material for soaps and shampoos. Production of palm oil has lead to large environmental and health problems. After media and NGOs in some countries focused on these problems the general public reacted strongly. The Roundtable of Sustainable Palm Oil (RSPO) was initiated by WWF in 2001. The principal objective of RSPO is "to promote the growth and use of sustainable palm oil through co-operation within the supply chain and open dialogue between its stakeholders". The Round Table has started development of criteria for sustainable palm oil production but these criteria are, as yet, not finished. The production of other ingredients also cause environmental effects but it is too difficult to assess the impacts, set requirements and verify the requirements.

Producers of palm oil and other interested parties can become members of the RSPO. Until the guidelines are in place we propose that if palm oil is used in the product it must be produced in an environmentally sustainable way. This would ensure that producers are supporting the idea of sustainable palm oil production and that they have access to information on what sustainable production means in practise.

Proposal:
If palm oil is used as a raw material in the product, the palm oil producer must be a member of The Roundtable of Sustainable Palm Oil (RSPO).

9.2 Animal testing

Products and ingredients have in the past been extensively tested on animals in order to avoid detrimental health effects. This testing have caused a lot of suffering for animals and the Cosmetics Directive contain a ban on animal testing of products from 1 December 2001. The directive also contain a ban of tests performed on ingredients or combinations of ingredients, as soon as an alternative method has been published by the Commission, after endorsement of its scientific validity by the European Center for the Validation of Alternative Methods (ECVAM) and the ECVAM Scientific Advisory Committee.

The Swan criteria contains a more strict requirement regarding testing of the finished product. The finished product must not be tested within the last 5 years before the date of application. We propose to use the same requirement in this context.

Animal testing of ingredients is a much more difficult question. Ecolabelling Norway wants to encourage the development of alternatives for animal testing. This also concerns testing of ingredients. We do, however, recognize the manufacturers need and obligation to ensure the safety of their product. A ban of the use of ingredients tested on animals during, let's say the last five years have consequences that are difficult to foresee. Will it mean that we halt innovation of ingredients with a lower environmental impact? What documentation would be adequate? One thing is sure: European Ecolabelling does not have the competence to accept alternative methods for testing of ingredient safety.

Proposal
The finished product must not have been tested on animals in the last five years before the date of application.

9.3 Critical Dilution Volume (CDV)

What are the worst potential environmental impacts from soaps and shampoos? In the absence of large-scale scientific studies we have to rely on what we know of the ingredients properties.

We have chosen to focus on the toxic effects measured in the OECD standard tests. Soaps and shampoos are released into the environment not in episodes but on a regular basis every day. Hence the chronic tests (that measure long-term effects) should be used rather than the acute tests (that measure short-term effects).

The CDV is a parameter that is common in ecolabelling criteria for household detergents. It is also used in the soap and shampoo criteria for the Nordic Swan. It is a measure of the total toxic impact, taking the

biodegradability into account, of soaps and shampoos in aquatic environments. Literally it is the volume of water needed to dilute one functional unit (1 g organic ingredients) to a level where no effects can be seen. The toxicity factor is determined as the lowest median toxicity factor of the compound divided by a "safety factor" (SF). The SF has been taken from the Risk Assessment Directive Technical Annex and is very high, especially in the cases where the TF is based on acute toxicity because no chronic data were available. The calculated CDV will be a rather high number and should only be used to compare products.

The CDV is a very good parameter because it enables a precise ranking of products according to very relevant environmental impacts using readily available data from standardised tests. Hence there is good reason to set a very strict limit on the CDV making this one of the most important parameters. The data we have is from products that are relatively "green" that are optimised to give a low environmental impact. The majority of the soaps and shampoos on the European market probable have higher CDV values. We choose a cautious approach until we know more of the market.

There are several possible approaches possible when setting the CDV requirement level. It might seem like a good idea to set the same level for products fulfilling the same function. This would mean that virtually all liquid soaps fail to qualify whereas the solid soaps would easily qualify.

We propose to use different requirement levels for different product categories. This would mean that we could get ecolabelled products in all categories, increasing the consumer's choice. Even though solid soaps have a lower score for the CDV and other parameters we should not exclude liquid soaps. Many people prefer liquid soaps and in the I´n´I-market they dominate completely. Differentiated requirement levels also enables us to "fine-tune" the requirement levels so that it is equally difficult for products in all categories to fulfil the requirement.

The documentation of this requirement might pose a challenge since many of the ingredients have not been tested. Testing is expensive but will probably lead to environment benefits because the producer can evaluate environmental performance together with quality, physical properties and price when developing products. Furthermore we can offer the consumers 100 % transparency, i.e. that all the product ingredients have been thoroughly evaluated not only regarding health but also regarding the environment! The Safety Factor is very high if no chronic data are given or if data for just one (or two) trophic levels are given. In this way the production of more data is encouraged which makes a more precise ranking of the ingredients possible.

Proposal

The Critical Dilution Volume (CDV_{tox}) is defined as follows:

CDV_{tox} (ingredient i)= (Weight (i) x DF (i) x 1000) / $TF_{chronic}$ (i)

$CDV_{tox} = \sum CDV_{tox}$ (ingredient i)

Weight (i) is the weight of the ingredient (in gram) per functional unit (1 gram organic ingredients). DF (i) is the degradation factor and TF chronic (i) is the toxicity factor of the ingredient (in milligram/litre).

Rubbing/abrasive agents in hand cleaning agents are not included.

The CDV must not exceed the following levels:

Shampoo, shower products and liquid soaps:	12 000 mg/g AC
Solid soaps:	2 300 mg/g AC
Conditioner:	15 000 mg/g AC

If the ingredient is on the DID-list the parameter values on this list must be used. If not, the licence applicant must supply test results. If no test results are given the ingredient will be assumed to be "worst case" and assigned TF=0,1 and DF=1. An exception is made with plant extracts and other ingredients isolated from plants or animals and with little or no chemical alteration. These ingredients are evaluated in the same way as fragrances, i.e. with TF=2 and DF=0,5.

9.4 Environmentally harmful compounds

As mentioned earlier, we want to target those ingredients that are both toxic and have a poor biodegradability or are potentially bioaccumulating. They stay in environmental compartments for a longer time than other toxic ingredients (with high biodegradability). Hence their toxic properties have a higher potential for creating negative environmental impacts. At the same time it is important to use existing regulations when setting requirements, i.e. use definitions and standard tests already in existing regulations.

Cosmetic products ingredients must fulfil the Directive on Dangerous Substances and the Directive on Dangerous Preparations. The products themselves are, however not subject to the Directive on Dangerous Preparations. The aquatic organisms cannot distinguish between an environmentally harmful cosmetic product and an environmentally harmful household detergent. Hence we propose to require that the products should not exceed the limits for classification as environmentally harmful. However it makes more sense to focus on classifications based on mixed risk phrases: R50/53, R51/53 and R52/53. Risk phrases based on toxicity or degradability alone are not necessary because the CDV requirement will probably exclude these products anyway.

In the same way as the CDV, the documentation will pose a challenge here. The classification is based on the lowest validated toxicity value regardless of species. The DID-list toxicity values may unfortunately not be used because the DID-values are based on the lowest <u>median</u> toxicity.

The fact that acute toxicity results are required makes it however easier for the licence applicant because acute test results are more available than chronic test results.

A test for bioaccumulation potential is required for ready biodegradability ingredients with a toxicity ≤ 10 mg/l, otherwise the ingredient will automatically be given the classification R51/53 (toxicity between 1 and 10 mg/l) or R50/53 (toxicity < 1mg/l). The octanol-water partition coefficient test is the standard test for bioaccumulation potential. It is difficult to use for surfactants because surfactants are bipolar and will stay in-between the phases. The more expensive BCF-test must be used.

The requirement level is not very strict. The intention is to exclude the "worst" products and encourage the production of more environmental data.

Rubbing/abrasive agents in hand cleaning agents are not included.

If no results are available the ingredient will be regarded as R 50/53. The following exceptions apply:

Fragrances and dyes: R 51/53.
Biological additives (Plant extracts and other ingredients isolated from plants or animals and with little or no chemical alteration): R 51/53.

Proposal
The product must not fulfil the requirements for classification for any of the following risk phrases according to The Directive of Dangerous Preparations:

N, R50/53: $(W_{R50/53}/25\ \%) \geq 1$
N, R51/53: $((W_{R50/53}/2{,}5\ \%)+(W_{R51/53}/25\ \%) \geq 1$
R52/53: $((W_{R50/53}/0{,}25\ \%)+W_{R51/53}/2{,}5\ \%)+W_{R52/53}/25\ \%)) \geq 1$

$W_{R50/53}$ = Weight percent of ingredients that may be classified as R50/53.
$W_{R51/53}$ = Weight percent of ingredients that may be classified as R51/53.
$W_{R52/53}$ = Weight percent of ingredients that may be classified as R52/53.

The risk phrases and the classification limits are defined in the same way as in the Directive of Dangerous Substances (67/548/EEC).

9.5 Poorly biodegradable ingredients

Ingredients that are poorly biodegradable have the potential to stay a long time in water environments and cause a lot of damage. The above mentioned requirements will reduce the quantity of poorly biodegradable ingredients but only to a certain extent and only in aerobic conditions.

9.5.1 Poorly (aerobically) degradable surfactants

The exclusion of surfactants not readily biodegradable in aerobic conditions is a standard feature of household detergent criteria of both the

EU Flower and the Nordic Swan. This requirement is now a part of the new Detergents Directive, which of course do not cover Cosmetic products. Again it seems reasonable to argue that the aquatic organisms cannot "see" the difference between a surfactant from a cosmetic product and a household detergent. The reason that surfactants are singled out is that surfactants are the main ingredients used in these products and because of their bipolar nature are usually quite toxic. One problem with this requirement is the definition of surfactants.

Should we consider only those ingredients that are listed as surfactants or all those ingredients that have a certain specified ability to reduce surface tension? The question is hereby left for the aHWG to discuss.

Proposal
Each surfactant used in the product shall be readily biodegradable.

9.5.2 Anaerobic degradability

Some ingredients in soaps and shampoos have been shown to degrade poorly in the standard test for anaerobic environments. In some cases elevated concentrations of anaerobically not degradable surfactants have been measured in e.g. sediments and wastewater sludges. The presence of soap and shampoo residues in wastewater treatment sludges may then reduce the chances of using it for instance for agricultural purposes. As a consequence restrictions have been set on ingredients both in the Swan and the Flower household detergent criteria and in the Swan soap and shampoo criteria.

The policy has been to exclude non anaerobically degradable surfactants and in some cases, but not all, limit non anaerobically degradable non-surfactants. This would mean that we treat surfactants in the same way as other ingredients.

The issue of anaerobic degradability has been disputed for years. Our reasons for why we think requirements on anaerobic biodegradability is appropriate, are given in a separate Annex.

We will propose <u>not</u> to exclude surfactants that are not anaerobically degradable. Instead we propose to introduce a requirement that will limit the amount of toxic <u>and</u> not anaerobically biodegradable ingredients.
The reasons for this are as follows:

- Soaps and shampoos consist almost exclusively of organic compounds. Many of the non-surfactants are as toxic (or more toxic) as surfactants.
- Exclusion of not anaerobically surfactants is not part of any regulation.
- We primarily want to target ingredients that are both poorly biodegradable <u>and</u> toxic.
- Many surfactants have not been tested. It would place a high burden on the licence applicant if all surfactants (down to a cut-off level) should have to be tested.

Many ingredients have not been tested for anaerobic degradability. The documentation can pose a problem. The documentation policy of the Nordic Swan and the EU Flower has been different. The Swan has in some cases (e.g. for non-surfactants in soaps and shampoos) accepted alternative documentation for anaerobic degradability: Ingredients that are readily degradable (aerobic) and do not absorb easily on particles (or easily desorb) or are not potentially bioaccumulating, are accepted as anaerobically degradable. The idea behind this lenient approach is that ingredients with such properties will not reach anaerobic compartments or they will not stay there long enough to do damage. We find it difficult to support this lenient approach until there is more scientific evidence to support it.

We do not have very accurate figures for the products on the European Market. The requirement level has been set very conservatively so as just to exclude the "worst" products. The limits are differentiated in the same way as the CDV in order to ensure a "balanced strictness level".

Proposal:
The content of ingredients that are not anaerobically degradable (or have not been tested for anaerobic degradability) and have a lowest acute toxicity ≤ 100 mg/l must not exceed the following levels:

Shampoos, shower products and liquid soaps:	15 mg/g AC
Solid soaps:	2 mg/g AC
Conditioners:	100 mg/g AC

9.6 Endocrine disrupters

The requirement on CDV and environmental risk phrases limits the toxic effect of the products but not all toxic effects are "covered". Lethality and non-lethal effects such as immobilisation are measured in the OECD standard acute toxicity tests but some effects like hormone disruption is not covered.

Some compounds are so similar to hormones that they "mimic" hormones. They can bind to hormone receptors and cause unwanted effects. Both animals and human beings can be affected. Many compounds have been tested. Many of the compounds that have been shown to cause endocrine disruption are on the EU list of endocrine disrupters. The list is not complete. More data is being produced all the time and some suspected endocrine disrupters are not on the list. The list contains few ingredients that are used in soaps and shampoos. We propose the inclusion of a ban on endocrine disrupters not because it is a big problem today but rather to eliminate a potential problem and raise awareness of the issue. The exclusion of suspected endocrine disrupters like benzophenone and butylparaben should be considered.

Proposal:
No ingredient must be on the EU list of substances that cause endocrine disruption class 1 or 2.

It should be considered to also exclude suspected endocrine disrupters such as benzophenone and butylparaben

9.7 Fragrances

Fragrances are very different from the other categories of ingredients.

They:
- are used in almost all soaps and shampoos
- are volatile
- are often complex mixtures
- are not necessary for the function of the product but important for many consumers
- they hide the smell of the other ingredients
- are most often not tested for environmental properties
- are suspected of causing health problems such as allergies

A large proportion (4 %) of the population has some kind of perfume allergy.

Additionally there are very many different fragrance mixtures in the products on the market.

The IFRA Guidelines contains advice on how to handle and use fragrances in products. The Guidelines are useful as basic requirements but not adequate to protect the consumers.

Perfumed products are not necessary for babies and small children. They are sensitive and hence the precautionary principle should be applied. The products used on them should be as mild as possible. The fragrance is not necessary for the function of the products. Hence we propose to exclude all fragrances in products for small children (< 3 years) and babies. Some of the products on the market for small children and babies contain fragrance, others not. The market seems to accept unperfumed products for this age group.

Product aimed at other age groups almost always contains perfume. In fact the fragrance seems to be an important part of the identity of the product. It is not advisable to exclude fragrances from ecolabelled products.

In order to reduce the incidence of fragrance-induced allergies we propose to limit fragrance substances with the risk phrase R43 or on the list of sensitizing substances in annex x. This is done as a precautionary measure to decrease the incidence of fragrance allergies.

We propose an additional requirement limiting the amount of R43-labeled compounds not related to the amount of product but related to the fragrance mix. No matter how little fragrance is used in the product we do not want the amount of R43-classified ingredients to be so high that the fragrance mix will be classified as harmful to the health. It would send the

wrong signals to the consumer even though the actual content of fragrances might be small.

Some fragrance compounds are banned altogether. They are of special concern because they are persistent and bioaccumulating and found in mothers milk.

The proposals regarding fragrances are concerned with health. The requirements on CDV, environmental risk phrases will all strictly limit the environmental impact of fragrances, hence we see little reason to further limit the environmental effects of fragrances.

The Nordic Swan has many years of experience with the requirements and their experience is that the requirement level on fragrances is strict but possible to achieve.

Proposal
a) Any ingredients added to the product as a fragrance must have been manufactured and/or handled in accordance with the code of practice of the International Fragrance Association.

b) Fragrances in products for babies/infants
Fragrance must not be added to products that are sold for use on babies/infants.

c) Quantities of fragrance substances
Fragrance substances classified R43 or fragrance substances specified in Appendix 5 may be present in the product in quantities not exceeding 0.01%(100 ppm).

Fragrance substances classified with R43 or found in Appendix 3 may be part of the fragrance mix in amounts below 1%. The total amount of substances classified R43 or found in Appendix 3 may, however, not exceed 5% of the fragrance mix.

d) Excluded fragrances
- Nitromusks and polycyclic musks, including for example:
Musk xylene: 5-tert-butyl-2,4,6-trinitro-m-xylene
Musk ambrette: 4-tert-butyl-3-methoxy-2,6-dinitrotoluene
Moskene: 1,1,3,3,5-pentamethyl-4,6-dinitroindan
Musk tibetine: 1-tert-butyl-3,4,5-trimethyl-2,6-dinitrobenzene
Musk ketone: 4'-tert-butyl-2',6'-dimethyl-3',5'-dinitroacetaphenone
HHCB (1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta(g)-2-benzopyran)
AHTN (6-Acetyl-1,1,2,4,4,7-hexamethyltetralin)

9.8 Dyes or coloring agents

Dyes/coloring agents (from now only called dyes) are often poorly documented. Many of them are very toxic but because they are added in very small amounts they are not restricted by any of the other requirements. We wish to avoid dyes that are toxic, bioaccumulating and

poorly biodegradable. Hence we propose to exclude dyes that may bioaccumulate. Color is however important for the consumer and could also be important as a help for the consumer to apply the correct dosage. In order to give the producer a reasonable variety of colors to choose from we propose to accept all dyes approved for use in foodstuffs. These have been scrutinized closely by the authorities before being accepted.

The requirement level is strict but allows a wide range of colors to be used.

Proposal
a) Any dyes or coloring agents used in the product must be permitted by Council Directive 76/768/EEC relating to cosmetic products 6 and its subsequent amendments.

b) Organic coloring agents must not be potentially bioaccumulating. In the case of coloring agents approved for use in foodstuffs it is not necessary to submit documentation on bioaccumulation.

9.9 Preservatives

Preservatives are added to inhibit microorganisms and maintain the color and appearance of the products. They are often very toxic and poorly biodegradable. They are added in so small amounts that they are not affected by the general requirements (CDV, environmental risk phrases, and limits on poorly biodegradable compounds). Environmentally very harmful compounds may cause damage even though they are only used in very small amounts. The combination of high toxicity, poor degradability and bioaccumulation gives a high risk for environmental damage.

Hence we propose to exclude compounds classified with the risk phrases R50-53 or R51-53 and at the same time potentially bioaccumulating.

We would like to make a distinction between disinfecting products and ordinary cleaning products. Ordinary consumers have no need for disinfecting products. We want to halt the tendency to use cleaning products with anti-microbial action as a selling point.

In the Cosmetics Directive formaldehyde is accepted as preservative even though it is classified as cancerogenous (Carc3, R40). Our requirements exclude the use of formaldehyde in ecolabelled products. However some preservatives release formaldehyde upon degradation. Sometimes the amount of formaldehyde released is above the classification limits for formaldehyde. We propose a restriction on formaldehyde releasers in order to cover this "loophole".

These requirements reduce significantly the number of accepted preservatives. Preservatives such as phenoxyethanol, methylparaben, ethylparaben and sodium benzoate are among the few accepted alternatives. Before we make a decision on the requirements we have to make sure that there exist technically usable preservatives for every product category covered by our definition.

Proposal:
a) The product may only include biocides in order to preserve the product, and in the appropriate dosage for this purpose alone. This does not refer to surfactants, which may also have biocidal properties.

b) It is prohibited to claim or suggest on the packaging or by any other communication that the product has an anti-microbial action.

c) Biocides, either as part of the formulation or as part of any preparation included in the formulation, that are used to preserve the product and that are classified with R50-53 or R51-53 risk phrases, in accordance with Directive 67/548/EEC 4 and its amendments or Directive 1999/45/EC, are permitted but only if they are not potentially bioaccumulating. In this context, a biocide is considered to be potentially bioaccumulating if the log Pow (log octanol/water partition coefficient) > 3.0 (unless the experimentally determined BCF > 100).

The concentration of biocides in the final product shall not exceed the maximum authorized concentration in Council Directive 76/768/EEC of 27 July 1976 on the approximation of the laws of the Member States relating to cosmetic products and its subsequent amendments.

d) Preservatives must not release substances that are classified in accordance with R3 and R4.

9.10 Hazardeous ingredients

The Cosmetics Directive prohibits the use of compounds that are classified as carcinogenic, mutagenic or toxic to reproduction in class 1 or 2. Compounds that are in Group 3 must be evaluated by the Scientific Committee, SCCNFP. The proposed requirement is stricter than the Cosmetics Directive and gives consumers an increased "margin of safety".

Proposal:
No constituent substance must be classified as carcinogenic (Carc),muta-genic (Mut) or toxic to reproduction (Rep)including rules for self-classification. No constituent substance must be classified as sensitizing Xi with R42 and/or R43 including rules for self-classification. See also the special rules applicable to fragrances in R15-R18 and R25.

Specific requirements are prescribed for biocides, either as part of the formulation or as part of any preparation included in the formulation (see criterion on biocides).

9.11 Quaternary ammonium salts

Conditioners often contain quaternary ammonium salts as conditioning agents. The Risk assessments show that quaternary ammonium salts have

unwanted environmental properties. They are often very toxic to aquatic organisms and poorly biodegradable. There are some quaternary ammonium salts that are readily biodegradable. According to the substitution principle. substitution should take place if a environmentally preferable alternative exists .

Proposal:
Quaternary ammonium salts that are not readily biodegradable shall not be used, either as part of the formulation or as part of any preparation included in the formulation.

9.12 Excluded and limited ingredients

Some ingredients are regulated in many criteria documents of the EU Flower and the Nordic Swan. Alkyl phenol ethoxylates and other alkyl phenol derivatives are poorly degradable and endocrine disrupting and are as such excluded by other requirements. However they are included because we want to put special emphasis on them.

NTA and EDTA are poorly degradable and are suspected of remobilizing heavy metals in e.g. riverbeds. NTA is in addition a suspected cancerogenous and is in Denmark restricted by voluntary agreements between unions and manufacturers.

Boric acid (CAS No. 10043-35-3) is on the Danish Environmental Agency's list of unwanted substances because of its toxicity to the reproductive system. Borates and perborates are easily converted to boric acid in the environment.

Phosphonates contain phosphorus which leads to eutrophication but the most important reason for limiting them is that they are poorly biodegradable. However there are some phosphonates which are more biodegradable. The use of these should be encouraged by ecolabelling.

Proposal
a) The following ingredients shall not be included in the product, either as part of the formulation or as part of any preparation included in the formulation:
- Alkyl phenol ethoxylates (APEOs) and other alkyl phenol derivatives
- NTA (nitrilo-tri-acetate)
- Boric acid, borates and perborates

b) EDTA and phosphonates
Ethylenediaminetetraacetate (EDTA) and its salts and not readily biodegradable phosphonates may only be added in solid soaps and only in a maximum content of 0,6 mg/g AC.

9.13 Biological additives

We have defined biological additives as ingredients that have been extracted from plants or animals and used in soaps and shampoos with little or no chemical alteration. They are sometimes called "natural"

ingredients, as opposed to synthetic ingredients. Essential oils is a typical example. They are used more and more in soaps and shampoos. The reason why we need to address these ingredients specifically is that they have seldom been tested for environmental properties: toxicity, biodegradability and bioaccumulation potential. Additionally manufacturers, organizations and consumers seems to think that since these ingredients are from natural environments they cannot be harmful to the environment or health. There is no scientific basis for this assumption. Though these compounds exist in nature they are, when used as ingredients, taken out of their context. So how can this problem be handled? The Ecolabelling Criteria for the Swedish Ecolabel "Good Environmental Choice" accept 0,5 % biological additives with very little indication.

The lack of data for biological additives would mean that we would have to use "worst case"-data when calculating CDV, anaerobic ingredients and environmental risk phrases. Our calculations show that no products containing biological additives would qualify for the ecolabel if we apply the standard worst-case-values. This would mean that almost half the products would be excluded without necessarily be more harmful to the health and the environment.

We propose to treat biological additives the same way as perfume.
This implies:
CDV: Toxicity factor = 0,02. Degradation Factor = 0,5.
Environmental risk phrases: R 51/53.
Anaerobic degradation: The ingredient is considered as anaerobically degradable.

9.14 Packaging

The LCAs show that the environmental impact of packaging is quite large. The impacts come from (in the case of plastics): the extraction/refining of petroleum, production of plastic raw materials, production of plastic, production of bottles and finally the disposal.

Setting requirements regarding the earlier life phases is difficult for much the same reasons as for the ingredients. It is difficult to get the required information and it is difficult to influence the producers. One in-direct way of limiting the impact from the early life-stages is to limit the amount of packaging used.

We propose that the requirements should focus on the disposal phase. Packaging constitutes a large part of the garbage from households and professional users. Hence the disposal of packaging is important. Almost all packaging are used only once. Clearly we should encourage re-use, but it is not much used, except for I´n´I-products (used in dispensers, etc). The second best alternative is material re-cycling. The extent of packaging recycling is increasing but still very low in Europe. The third best alternative is to utilize the energy content by incineration. This alternative is increasing very fast. The worse, and unfortunately the most frequently used alternative is landfilling.

No matter how the packaging is disposed of after use we want packaging to be used efficiently. Hence we propose a requirement on the maximum packaging weight pr unit product.

How can we make sure that the packaging is disposed of in an environmentally preferable way? The ecolabel have very little influence on the negative impacts of the disposal of packaging:

- leaching of toxic compounds, filling of space and waste of resources from land-filling
- emissions of dangerous compounds from incinerators and low levels of usage of energy

Re-cycling is the preferable alternative after re-use. We propose promotion of re-cycled materials by means of the requirement on weight packaging pr weight product. We also propose the promotion of re-cycling by requiring that all plastic materials be labelled. Furthermore we want to promote re-cycling of cellulose fibers by requiring that all card-board packaging consist of at least 80 % recycled material.

Burning of packaging waste enables the utilization of the energy stored in the material but in many cases lead to release of very toxic compounds such as dioxins. We do not have access to enough test results to determine whether dioxins from incineration of PVC is a significant problem.

A lot of the packaging ends up in landfills. Plastic materials will degrade very little. Plastics contain different additives, f ex UV stabilizers and pigments. These additives are smaller molecules than the polymers and hence may migrate and create a toxic impact in the run-off from waste dumps. The producers should be able to demonstrate that the additives do not leach out into the product.

The proposal on criterion for packaging is not yet finalized regarding the materials used in the bottles and we ask for the following information from the packaging producers:
- what compounds are released upon incineration of the different packaging materials and in what amounts?
- what additives does the plastic contain?
- have leaching studies of the additives been made?
- can the material be recycled together with other materials?
- are there systems in place around Europe to recycle the material?

The environmental effect of the product depends very much on the dosage. The consumer will hopefully use no more than the needed dosage but it must be easy to regulate the amount of product coming of the bottle. We propose that the primary packaging should be designed in order to make it easy to apply the correct dosage. The combination of viscosity of the product, tip opening and softness of the primary packaging determines how easy it will be to apply the correct dosage.

Preliminary proposal

a) The Weight/Content Relationship must be < 0,30 g packaging/g product.

$$VCR = \sum ((W_i + N_i) / (D_i \times r))$$

W_i = The weight (grams) of packaging-component i (primary-, secondary- or tertiary packaging) inclusive label.

N_i = Weight (grams) of not-recycled material of packaging-component (primary-, secondary- or tertiary packaging). If the packaging component does not contain recycled material then $N_i = V_i$.

D_i = gram product the packaging-component contains.

r = Return number, i.e. the number of times packaging-component **i** is used for the same purpose through a system of return or refill (r=1 if no reuse occurs).

If the packaging is reused t is set to 20 for plastics and 10 for corrugated board unless the applicant can document a higher number.

b) Cardboard packaging must consist of at least 80 % recycled material.

c) Labeling of packaging

To allow for identification of different parts of the packaging for recycling, plastic parts in the primary packaging must be marked in accordance with DIN 6120,Part 2 or the equivalent.

Caps and pumps are excepted this requirement.

d) Dosage

The packaging must be designed to make correct dosage easy, f.ex. by ensuring that the opening at the top is not too wide.

9.15 Testing of efficiency and mildness

It is important that ecolabelled products do not damage the skin and hair and that the products are as efficient as the majority of other products on the market. It is not only important for the public's opinion of the Flower label. It is also important that producers are not tempted to "dilute" their products with "inert" organic ingredients (e.g. propylene glycol) in order to fulfil the criteria. Furthermore we wish to promote efficient products in order to reduce overall consumption. Finally we wish to protect consumers health further than the Cosmetics Directive by setting tough standards for products "mildness".

Experts within manufacturing companies and test institutes inform us that no standard test exists. COLIPA have developed guidelines for testing of efficiency but no branch standards exist.

There seems to be many tests and few of them have been published. Those who have developed the tests are generally not willing to give them away for free. It is not within the scope of this project to finance development of tests.

We propose that license applicants must submit laboratory test results for the efficiency and "mildness" of the products. The products should perform as well, or better than, the average of the products on the

market. A certain quality control of the tests is necessary. Guidelines for test quality will be proposed at a later stage in the project.

Preferably the tests should be performed by a neutral Third Party.

Proposal
The product must be as efficient as, or better than, the average of the products on the market.

The product must not, if used as intended, lead to damage of skin or hair.