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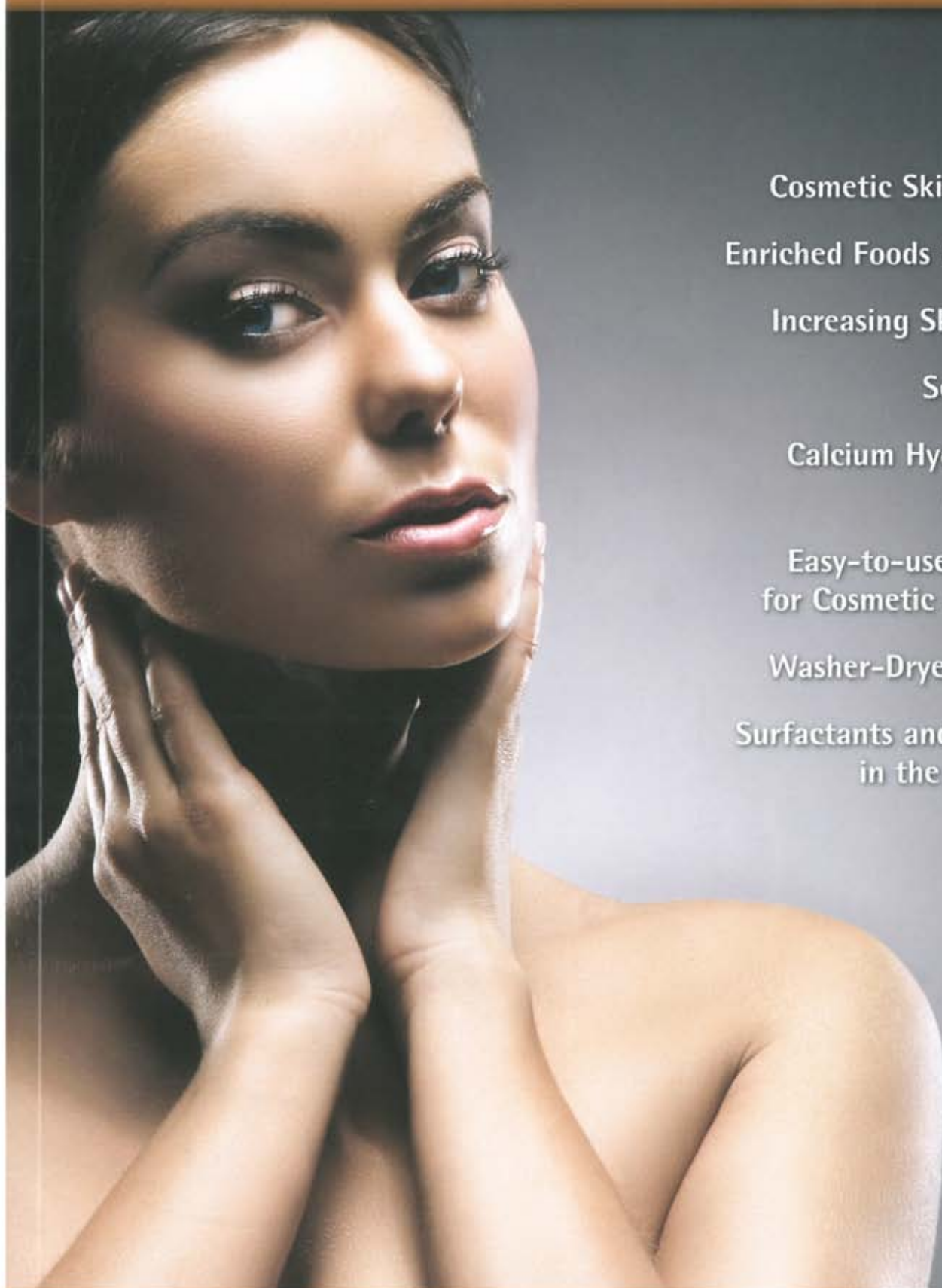
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Opportunities and Limitations of Enriched Foods in Swiss Law

■ Beauty from Within

In the field of nutrition, health is a driving purchasing motive. In the field of cosmetics, holistic approaches are sought. Functional foods, whether in the form of nutritional supplements or traditional functional foods, foster »beauty from

within«. This market has been in a growth phase for years. The global growth rate of revenues for »Beauty Functionals« in 2007/08 is estimated at 7.4% (1). The Kline Group has forecast that sales worldwide from 2007 to 2012 will almost double. According to Euromonitor International, there was a turnover of the

equivalent of €110 million on supplements and foods »for beauty« in both France and Germany in 2008.

In one of the home markets of Beauty Foods, the U.S., a survey (2008 Black report) concluded that most women take dietary supplements or consume functional foods, and are therefore open to

Abstract

Beauty and Vitality (»Better-aging«) are deeply rooted needs in an aging population. In the field of nutrition, health has become a driving purchasing motive. The market for »beauty from within« has been in a growth phase for years. The product types range from dietary supplements to functional foods. Above all, food with the functional additive »beauty« has particular potential. Even though the EFSA (European Food Safety) has in recent times placed severe limitations on the type of »health claims« which can be made, Euromonitor International has con-

firmed over the last few years the upwards trend with »beauty functionals« in the American, European and especially in the Asian market. Within the context of an internal innovation project (duration 2009 to 2010) at the Institute of Food and Beverage Innovation ILGI (ZHAW Wädenswil, Switzerland) the question emerged as to whether it is possible to create sensorily appealing »Beauty pastry« – taking into account current Swiss law and the technical feasibility. The respective areas of competence at ILGI; cosmetics, nutrition and technology complemented each other perfectly.

After distinguishing between definitions and terms such as functional foods and special foods, the food law landscape in Switzerland and Europe must be considered. Against this background, potential active ingredients are selected on the basis of their chemical-physical and toxicological properties and combined with regional and/or exotic food ingredients. Product prototypes (a savoury bread and a sweet muffin version) were produced in the Backwarentechnikum (school of baked goods) and were subjected to sensory testing by a semi-trained panel.

additional Nutricosmetics (refers to a non-legally binding definition of food products with cosmetic additional benefits). 74% of women surveyed would test Nutricosmetics if they are easy to consume (»convenience« aspect). 65% would want to enjoy this as a chocolate bar or some other form of traditional food. As with the use of cosmetics, 80% of surveyed women would expect visible results after 2 to 4 weeks (2).

According to various companies, more and more consumers are able to infer a causal relationship between a healthy diet and skin. Glowelle® a beauty drink from Nestlé (USA), Norélift® a French beauty jam and Jeunesse Anti Aging Goodness® fruit juice from Italy are just some examples of this type of product. Even the »monks« at the monastic brewery Neuzelle in Germany offer an »anti-aging beer«.

In addition to beverages, dairy products, margarine, muesli bars and fruit spreads, bread and baked goods are an interesting, as yet under-exploited category in Switzerland in the area of functional food. Wellness breads with enhanced nutritional value, such as the German bread enriched with omega-3 fatty acids are of special interest for certain population groups. In Switzerland, about 130 g of bread is consumed daily, with a growth rate of an additional 2.3%. Half of this consumption takes place outside the home. In Germany, however, 230 g of bread and biscuits are consumed per day, and the consumption of baked goods with enhanced nutritional value is increasing (3). According to »Brot-Monitor Schweiz« 2006 (4), bread is still regarded as the main staple food by 29% of the population, and is consumed on a regular basis.

■ Traditional Baked Goods as a New Vehicle of Functionality?

Within the context of an internal innovation project at the Institute of Food and Beverage Innovation ILGI (ZHAW Wädenswil, Switzerland) the question emerged as to whether it is possible to create sensorily appealing »Beauty pastry« – taking into account current Swiss law and the technical feasibility. The respective areas of competence at ILGI; cosmetics, nutrition and technology complemented each other perfectly. The product under development is based on grains, and being enriched with phytochemicals and other skin-relevant substances, this will fit the definition of a conventional food according to the Swiss legislation pertaining to active ingredients concentrations, composition and the claims which can be made.

| Legal Regulation | SR Reference Number | Main Topic |
|--|---|---|
| Lebensmittelgesetz, LMG | 817 | |
| Lebensmittel und Gebrauchsgegenständeverordnung, LGV | 817.02 (release 23.11.2005) | Nutritional information in food with respect to vitamins and minerals |
| Verordnung des EDI über die Kennzeichnung und Anpreisung von Lebensmitteln, LKV | 817.022.21 (release 01.01.09) | Nutrition and health-related statements and other BAG approval |
| Empfehlungsliste/Richtlinien der Eidg. Ernährungskommission (EEK) zuhanden des BAG | release January 2006 | »Nutrient function claims« for vitamins and minerals |
| Verordnung des EDI über Getreide, Hülsenfrüchte, Pflanzenproteine und deren Erzeugnisse | 817.022.109 (release 12.12. 2006) | |
| Verordnung des EDI über die in Lebensmitteln zulässigen Zusatzstoffe | 817.022.31 (release 01.04.2008) | Food additives such as flavourings or colourings (GMP) |
| Verordnung über Zusatz essenzieller oder physiologisch nützlicher Stoffe in Lebensmitteln | 817.022.32 (release 23.11.2005/01.11.2010) | Maximum doses and declaration of additives (labelling and permissible claims) |
| Verordnung des EDI über Speziallebensmittel | 817.022.104 (release 12.12.2006) | Concerns phytochemicals (Secondary metabolites) |
| Einstufung pflanzlicher Stoffe und Zubereitungen als Arzneimittel oder als Lebensmittel, BAG | release 29.12.2006 | |
| Wirtschaftsliste »Health Claim« Praxishandbuch Functional Food 2007 | | EFSA list, official approval by the EU Commission in 2012 |

Table 1 Swiss legal regulations and other reference works considered, (abbreviations: BAG: Bundesamt für Gesundheit, Federal Office for health (Berne, Switzerland), EDI: Eidgenössisches Departement des Innern, Federal Department of Home Affairs (Berne, Switzerland))

■ Legal Situation in Switzerland and the EU – Health and Nutrition Claims

The first matter to consider is the question as to which category the developed product is assigned by law. The categories of traditional food and/or special food (with sub-category dietary supplements) can be placed on the market without registration or license, if their composition, applications and labeling (including claims) are described in Swiss food legislation. The manufacturer is subject to self-regulation (5). This determines the claims which can be made about the effect of added essential or nutritionally valuable substances. The regulations in the food sector (Table 1) clearly separate remedies. They are designed to prevent fraudulent and misleading claims being made and thereby protect the health of consumers, as well as to protect the »traditional« foods such as bread, milk, etc. in their quality and appearance. Vitamins and minerals, and trace elements concentrations can be increased and, within narrow limitations, claims about their effect (Health claims in accordance with Appendix 8 of the Federal Department of Home Affairs (FDHA) ordinance on the labeling and

advertising of foodstuffs, (LKV), or according to separate approval) can be made. Some of the promising phytochemicals are discussed in the ordinance on special food. They can be added. Except for highlighting their nutritional value, they should not be credited with having any special effect, as is partially possible in the EU. Once (the) health claims become legally valid in the EU (expected mid 2012), they will be included the Swiss LVK regulations as soon as possible (6). A selection of the positive claims actually allowed in Switzerland for vitamins and minerals (focusing on skin-related substances) is shown in Table 2. An interesting legal argument concerning the interpretation of product classification in the EU for food products with added cosmetic value, or Nutricosmetics, and related problems of misleading advertising claims has been presented by the lawyer Reinhard A. (7): »Claims of efficacy can only be made when these have a sufficient scientific basis. Notions of beauty can be very subjective and it is very difficult to objectively prove a cosmetic effect. This raises the question as to whether a particular claim is a health-related claim within the meaning of »health claims« according to the relevant ordinance ((EG) 1924/2006) and is

thus subject to approval, or whether it is purely a »beauty« claim with no link to health, e.g. tanned skin is a purely optical effect; beauty as part of general well-being«. A similar argument is theoretically possible in Switzerland according to another regulation (SR 817.02 Art. 10/c), as long as no health claims are implied.

■ »Beauty Muffins« from the Bakery

An initial selection of skin-relevant substances has been derived from the results of various epidemiological studies, compared with Swiss law and the capacity these compounds to enrich food, with particular attention being paid to the »nutrient function claims« sections of the relevant regulation (LKV SR 817.022.21 and SR 817.022.32, Table 1) and the claims which could be made at a later date. In addition, these substances had to be assessed to determine their chemical and thermal stability, since core temperatures can exceed 100 °C during the baking process. Furthermore, various processing methods have been discussed as to how to avoid high temperature exposure, as is the case with subsequent cold

| Nutrient | Daily Requirement | Permissible Claim |
|-----------------------------|-------------------|--|
| Beta-Carotene | 4.8 mg | »Helps maintain tissue, skin and mucous membranes; is an antioxidant and can soak up free radicals« |
| Vitamin B2 Riboflavin | 1.6 mg | »Helps maintain tissue, skin and mucous membranes.« |
| Niacin | 18 mg | »Necessary for the normal functioning of the skin.« |
| Vitamin C | 60 mg | »Functions as an antioxidant.« |
| Vitamin E | 10 mg | »Stabilises unsaturated fatty acids the cell membrane; as an antioxidant can bind with free radicals.« |
| Selenium | 50 mg | »Protects the body from oxidation reactions. Has antioxidant properties.« |
| Vitamine A, C, E, and Selen | | »Have antioxidant properties.« |

Table 2 List of the claims permissible in Switzerland for vitamins and minerals (focussing on skin-relevant substances)



Fig. Test series of sweet product concept with Goji berries

| Active Compound / Primary Source |
|--|
| <ul style="list-style-type: none"> • natural carotenoid mixture (water and oil-soluble extract, commercial products) • Goji berries (»super-fruits«, <i>Lycium barbarum</i> contains polysaccharides (LBP) carotenoids and flavonoids) |
| Table 3 Sweet product concept with fruit |

| Active Compound / Primary Source |
|---|
| <ul style="list-style-type: none"> • Tomato powder (commercial product with 2% lycopene content)* • Chopped tomatoes, dried • Grape seed flour (polyphenols OPC) • Grape seed oil (polyunsaturated fatty acids) |
| * maximum daily dose permitted for special food is a triple dose of a total of 18 g lycopene per 100 g baked goods |
| Table 4 Salty-savoury product concept with vegetables |

filling or a coating process following the actual baking process (Fig.).

The basic recipe must comply with the regulations covering cereals, pulses, vegetable proteins and their products (SR 817.022.109). These determine the composition of such baked goods, with respect to such things as calories and fat content. The »Beauty muffins« being aspired to fall within the category of pastry products (which includes brioche, muffin etc.) Eating one of these muffins should provide about one-third of the average daily requirement of the main actives. An additional cost SFr.-.10 or €-.08 per portion incurred by adding a compound is tenable.

In order to enhance the sensory appeal, the effectiveness and the communication concept of »Beauty muffins«, selected lead compounds (lycopene and β -carotene) were supplemented with other foods. Here, both a sweet and a salty-savoury product concept were pursued (Table 3 and 4).

The concentration of β -carotene should not exceed a daily dose of 14.4 mg per 100 g of bread (according to SR 817.02, SR 817.022.21, Table 1). At this dose, the legally permissible additional triple dose is already included in the calculation in order to offset the potential loss of active ingredients by the time of consumption.

A compliant claim for the salty-savoury »Beauty muffins« must refer only to so-called »soft claims« such as »Beauty«, etc. and details such as »contains tomato (extract)«, »contains grape seed flour and cold-pressed grape seed oil«. Making a connection to a health and beauty enhancing effect must be left to the consumer themselves. Specifying lycopene in the nutrition labelling is permitted because lycopene is a naturally occurring substance in tomatoes. If there is a desire to highlight lycopene as an active ingredient, for example »contains lycopene«, this requires authorisation and the submission of efficacy studies. A compliant claim for the sweet »Beauty muffins« with goji berries can, in addition to a »soft claim« make »hard claims« such as » β -carotene helps maintain tissue, skin and mucous membranes; is an antioxidant and can soak up free radicals. Vitamin C (goji berry) functions as an antioxidant« connected to information on the nutrition declaration.

Further steps should be the optimization of basic recipes with innovative calorie-reducing sweeteners, sugar substitutes and dietary fibre. To improve the evidence of effectiveness, and/or as a supplement to the current EFSA list, a possible correlation must be established between the consumption of enriched products and a biological marker, in this case, a positive

change in the skin structure. The experience with »Muffins Beauty« led to further internal project ideas with enriched foods in the bakery and beverage sector. Numerous product versions enriched with phytochemicals (polyphenols from cocoa and coffee beans, green tea, anthocyanin-rich berries, etc.) are conceivable. Legal room to manoeuvre is limited in Switzerland, but it does allow for traditional foods to be redefined with an added »Beauty« value, and this invites not only the food industry to take innovative approaches. At the very least, we are one step closer to the dream of eating one's way to beauty.

References

- (1) Heller L. (2010), The global market for beauty foods, www.nutraingredients.com, Aug. 2010
- (2) Beyer A. M. (2008), You can lead a woman to nutricosmetics and cosmeceuticals, but will she try them?, GCI magazine Nov. 2008, www.printthis.com
- (3) Compagno T. (2008), Brotkonsum in der Schweiz, Coop Zeitung Nr. 50, 9.12.2008
- (4) Ergebnispräsentation Brot-Monitor Schweiz 2006, Präsentation DemoScope Juli 2006
- (5) Schüpbach S. (2009), Politik- Fisch oder Vogel, Nahrungsergänzungsmittel, OTX World, No 47, April 2009

- (6) *Städler E.* (2011), Neue Regeln für die Gesundheitsversprechen, *Alimenta*, 22/2011
- (7) *Reinhart A.* (1999), Beauty Food- Schönheit von Innen, chapter 3.10 Lebensmittel, in *Praxishandbuch Functional Food*, 08 02 33, Grundwerk Auflage 1999, 39. Aktualisierungs-Lieferung 04/2009, Behr's Verlag

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