

# **Analysis of Regulatory Framework affecting Sensory Properties of Organic Products**

**Comparative report on specific sensory related  
requirements in regulations and standards  
for organic production**

**Otto Schmid**

**July 2009**



**Research Institute of Organic Agriculture (FiBL)**



# Analysis of regulatory framework affecting sensory properties of organic products

Comparative report on specific sensory related requirements in regulations and standards for organic production

## Deliverable 1.1

EU Project ECROPOLIS - Contract No. 218477-2 (FP 7)

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CH	Bio Suisse	<a href="http://www.bio-suisse.ch">www.bio-suisse.ch</a>
DE	BNN	<a href="http://www.n-bnn.de">www.n-bnn.de</a>
NL	Vereniging Biologische Productie	<a href="http://www.vbpbiologisch.nl">www.vbpbiologisch.nl</a>
PL	Ekoland	<a href="http://www.ekoland.org.pl">www.ekoland.org.pl</a>
IT	Bioagricoop Scrl	<a href="http://www.bioagricoop.it">www.bioagricoop.it</a>
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DE	ebl Naturkost	<a href="http://www.ebl-naturkost.de">www.ebl-naturkost.de</a>
NL	FairConnect	<a href="http://www.fairconnect.nl">www.fairconnect.nl</a>
PL	Tast	<a href="http://www.tast.pl">www.tast.pl</a>
IT	Organic Oils	<a href="http://www.organicoils.it">www.organicoils.it</a>
FR	Unébio	<a href="http://www.unebio.fr">www.unebio.fr</a>

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Seventh Framework Programme for European Research & Technological Development of the European Commission.

For further information see the project homepage at [www.ecropolis.eu](http://www.ecropolis.eu)

## Executive summary

This report provides a synthesis of the analysis of regulatory framework affecting sensory properties.

The main focus of the analysis was on the most relevant differences between the EU rules for organic production, governmental rules and private standards, which are relevant for sensory properties.

The following Table 1 gives an overview, which private standards have specific processing standards.

**Table 1 Overview on product specific processing standards of countries involved in the ECROPOLIS project**

Area	Bio Suisse-CH	Bioland - DE	Naturland-DE	AiAB-IT	Nature & Progrès France	Demeter CH, DE, IT, NL, FR, int	Others: BNN
Milk and milk products	X	X	X	X	X	X	
Meat and meat products	X	X	X	?	X	X	
Egg and egg products	X	X	-	?	X	X	
Bread and bakery products	X	X	X	X	X	X	
Other cereal products	X	X	X	X	-	X	
Soya products	-	X	-	-	-	-	
Other arable products like potatoes	X	X	X	-	-	X	
Fruit and vegetable products	X	X	X	X	X	X	
Oil and fat products	X	X	X	X	X	X	
Herbs, soup, sauces, etc.	X	X	X	X		X	
Alcoholics (inc. wine, beer) and vinegar	X	X	X	X	X	X	
Wine	X	X	X	X	X	X	
Fish products	-	-	X	-	-	-	
Honey products	X	X	X	-	-	X	
Yeast	X	X	X	-	-	X	
Algae products	-	-	X	-	-	X	
Gastronomy	X	X	X	X	X	X	
Flavours		X	X	-	X	X	x

The standard comparison of five private national standards in France, Germany, Italy and Switzerland and three international standards (IFOAM, Codex Alimentarius and Demeter International) showed that the most significant differences are:

- the use or non-use of ingredients in particular with flavour and colour compounds;
- the use or non-use of specific thickeners in particular for milk-products and vegetable/fruit products;
- the use or non- use of nitrate/nitrites in meat products;
- the use or non-use of natural flavours (e.g. for yoghurts, juices or bakery products);
- the use of organic yeast (mainly for bakery products);
- the exclusion of some processing methods like high-temperature processing of oils or of milk.

In the analysis a preliminary assessment was made how the different restrictions might impact sensory properties (see Table 2)

**Table 2 Potential direct impact matrix of selected standards requirements on factors influencing sensory properties**

	Issues	Criteria	Direct impact on sensory properties				Other impacts e.g. shelf life
			texture	flavour		appearance	
				taste	odour		
Use and origin of ingredients	Organic and non-organic ingredients	Use or non-use of organic ingredients	XX	XX	XX	XX	
		Use or non-use of non-organic ingredients	X	XX	XX	XX	
		Use or non use of functional ingredients (e.g. milk protein)	XX	X	X	X	
		Use or reduction of sugar	-	X	-	-	X
	Non-agricultural ingredients	Use salt and water	-	XX	-	X	shelf life
	Other issues	Use or non-use of colouring ingredients	-	-	-	XX	
		Use of extracts for flavour	-	XX	XX	-	
Use of additives	Restrictions	Lower amount of sulfites or nitrates/nitrites (e.g. for meat)	-	XX	X	(X)	
	Use or non-use	ascorbic acid	-	(X)	-	X	
		antioxidants <sup>1</sup>	-	(X)	-	X	
		Colorants	-	-	-	XX	
Use of processing aids and other substances		non-use of GMO and derivatives	-	-	-	-	
	Other substances	Use or non-use of Ion exchange resins	-	XX	-	XX	
		Use or non-use of natural flavours	-	XX	XX	-	
		Use or non-use of organic yeast	(X)	X	X	-	
		Use or non-use of bacterial starters	-	X	X	-	
Processing methods	Restrictions	Heat/pressure restrictions	XX	XX	-	X	shelf life
	Non-use/prohibition	Irradiation	-	-	-	-	shelf life
		Micro-waves	-	-	-	-	shelf life?
		No homogenisation	XX	X	-	XX	
	Other issues	Reconstitution	X	XX	X	-	
Over-processing (e.g. double pasteurisation)		(X)	X	-	-	shelf life	
Packaging	Restrictions	Non-allowance of double packaging	-	-	-	-	packaging design
	Non-use/prohibition	Restricted use of certain packaging materials.	-	(X)	-	X	
Storage	Storage requirements	Restricted methods: Cooling, deep-freezing, drying, regulation of water content, controlled atmosphere	X	X	-	X	shelf life
Transport	Max. transport time for raw products	Milk collection	-	X	-	-	
	Animal transport	Max. transportation	(X)	(X)	-	(X)	
		Reduction of stress	X	(X)	-	(X)	

X weak impact

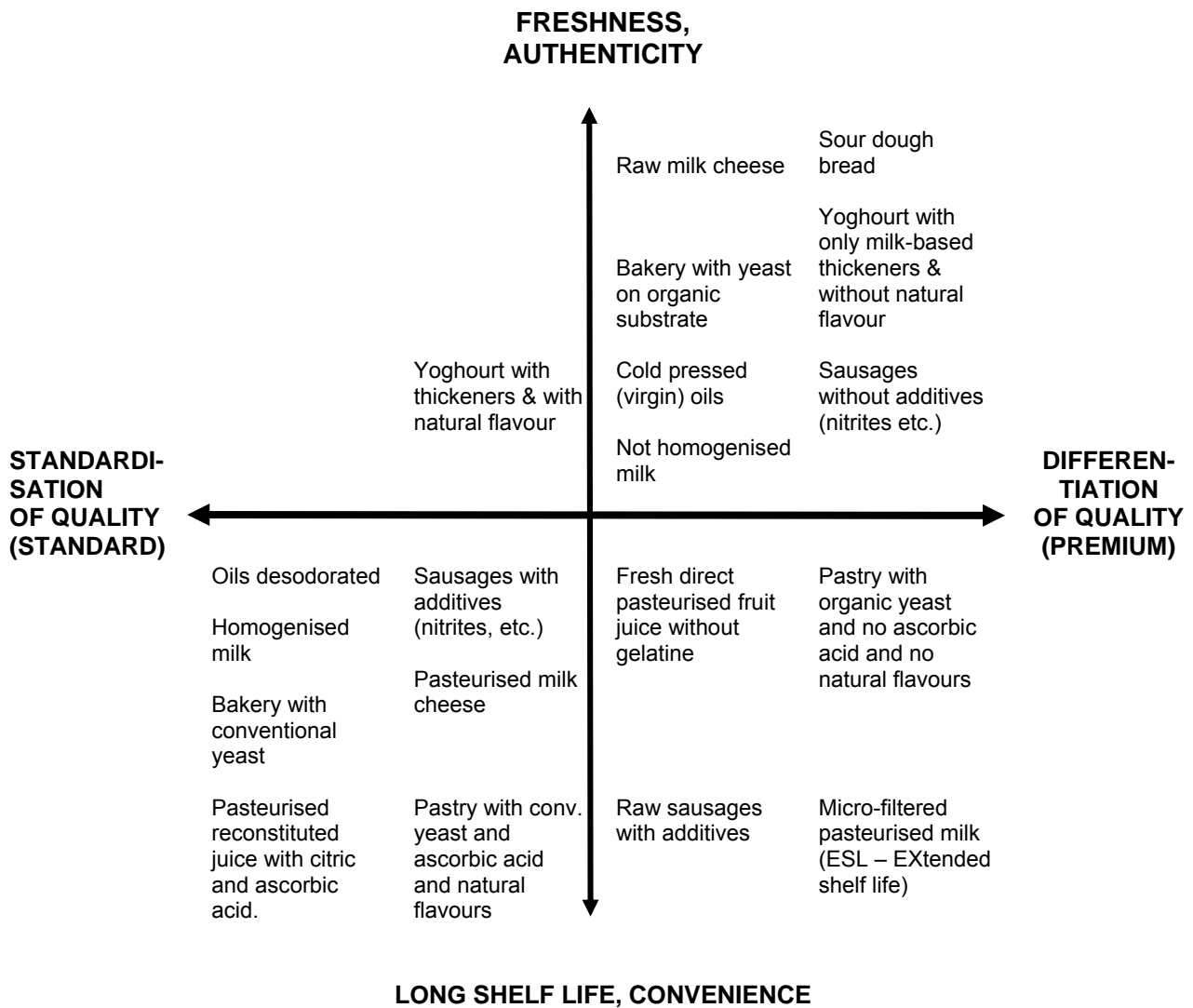
XX strong impact

<sup>1</sup> Antioxidants are permitted in the EU organic rules, e.g. E306 tocopherol for fats and oils

Furthermore, these differences were linked to a typology, where products are differentiated in four different segments.

Along the horizontal axis are some more standard products and others more premium products. On the vertical axis there are products positioned with a long shelf life and vice versa products with freshness/authentic character.

When making sensory testing it is important to take into account to what typology of products the different products belong. Such a typology might also be helpful, when comparing preferences of different consumer segments.



**Figure 1: Typology of processed organic products linked to differentiation/standardisation as well as to freshness/long shelf life.**



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## Foreword

This report on the “Analysis of regulatory framework affecting sensory properties of organic products” has been done with the EU funded project ECROPOLIS. The main purpose of the ECROPOLIS project is to provide and exchange sensory information on organic food, not only to the industry (organic associations, producers, processors, retailers, wholesalers) but also to the public at large: the consumers.

Distributors and promoters of organic food claim superior taste of their products compared to conventional alternatives. This claim is discussed at large and deserves more scientific background. Besides, consumer loyalty depends on the overall liking of a product, of which the sensory experience is an important aspect. Knowledge about these sensory experiences is crucial for producers and marketers of organic food to offer products which taste superior and meet consumer expectations.

To meet these market needs, ECROPOLIS is developing a centrally based and multilingual database, the first European Organic Sensory Information System (OSIS). This database will provide sensory information in an easy and traceable way and includes:

- Sensory profiles of organic food;
- Consumer preferences and marketing strategies;
- The impact of organic regulations on sensory properties.

The database will enable exchange of data among all actors, will be multilingual and centrally based.

The project consortium consists of 20 partners from 6 European countries, composed of small to micro enterprises (SMEs), SME Associations (SME-AGs) and scientific research institutions. In this way, different competences and expertise are combined, to enhance a successful implementation of the project.

The impact of EU legislation and standards of organic farming associations on the taste of organic products was analysed in this report. These legislation and standards define production methods and ingredients, which could have an effect on the sensory properties of the organic products. A review of relevant scientific literature on the sensory evaluation of organic food, which will be summarised in another publication, is providing the basis for this.

This report on the regulatory framework relevant for the sensory properties of organic food is an important starting point for the research work in this project. The main focus is on the different requirements for processing of organic food and not on conventional food.

Within the project an interesting typology has been developed in visualising the type of products related to standardisation versus differentiation on one hand and freshness/authenticity and long shelf life on the other hand. This should help to facilitate the appropriate selection and comparison on of products in sensory testing and facilitate also focus group discussions with consumers as foreseen in the ECROPOLIS project.

The project coordination wants to thank the author and all the experts which contributed to the report with their feedback as well as the European Union for their financial support.

Frick, Switzerland, July 2009

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*Unit of Food Quality and Safety*  
Overall and scientific coordinator of the ECROPOLIS Project

# 1 Introduction

## 1.1 Task description for this report

The task description is based on the Annex I of the ECROPOLIS project grant agreement which is slightly adapted regarding the new EU regulations for organic production.

The main focus of this task is on the specific requirements of public regulations and private standards for organic production which affect sensory properties. This includes the new Council Regulation (EC No 834/2007) and the related rules for implementation laid down basically in the EU Commission Regulation 889/2008, which replace since 2009 the old Regulation (EEC) 2092/91. In addition, the most important private standards and governmental regulations for organic food and farming in the countries involved (CH, DE, FR, IT, NL; PL) are analysed, as some of these standards have additional requirements that may be relevant to sensory properties.

The main data source was the public standards database ([www.organicrules.org](http://www.organicrules.org)) developed by P1 (in cooperation with DARCOF, DK) in the EU funded FP6 project "EEC 2092/91 Revision" ([www.organic-revision.org](http://www.organic-revision.org)).

These data, some of which have been updated, were used to summarise the relevant standards requirements of the EU regulation for organic production along with additional requirements deriving from private standards for the selected product groups and products. In a second step, the standards requirements were linked with the potential impact factors relevant to sensory properties found in the literature review in T 1.1 and T 1.2.

This analysis is used to develop a hypothetical impact matrix for the different product groups, which can later be compared and correlated in T 5.1 with the results from the sensory analysis in WP3 and the results of the consumer perception research in WP4.

The main emphasis of the analysis will be on the requirements for processing (e.g. use or non-use of specific additives).

A fact sheet with the main relevant standards requirements were drafted for each of the selected products. The fact sheets will be completed in the synthesis WP under T 5.1. P1 will perform this task.

It is important to be aware that many sensory properties are influenced strongly by certain additives or processing methods. However a key determining role for the sensory quality and profile of a product remains to the individual processor/operator and his/her skills, experiences and care within the given and/or chosen frame by the public and/or private regulatory framework.

## 2 Methodology and state of knowledge

### 2.1 Methodological approach

The analysis of the standards was done in the following steps:

1. Description of the different regulations and standards with Identification of the general relevant requirements mainly in processing, which might have a direct or indirect influence on taste (chapter 3.1).
2. Analysis of the specific sensory-relevant requirements in regulation mainly in processing, in particular differences between the EU Regulations for organic production and national governmental rules, private standards and guidelines on international as well as on the level of associations or companies (chapter 3.2).
3. Indicating links between the differences found related to sensory properties (chapter 4).
4. Describing product profiles of the selected product groups in fact sheets (chapter 6).

The methodological approach chosen is mainly looking at the processing requirements and their direct or indirect impact on the sensory properties. When looking at the direct impact the main focus is in particular on structure, taste, odour and colour, but also e.g. on shelf life.

As indirect impact is meant e.g. the consequences if a restriction leads to the use of other additives and processing methods, which affect sensory properties differently.

**Table 2.1 Focus areas chosen for the standards analysis related to sensory properties.**

Area/ focus of standard	Restriction	Relevant standard/ guideline	Potential direct impact on sensory properties	Pot. other impact on product or process	Indirect impact	Chosen product groups
<b>Ingredients</b> <b>Additives</b> <b>Proc. aids</b> <b>Enzymes,</b> <b>Yeast,</b> <b>etc.</b>  <b>Processing methods</b>  <b>Storage and transport</b>	Non- use/ Exclusion  Restrictions	EU Codex Governmental rules AIAB Bioland Bio Suisse Demeter Naturland Nature & Progrès etc.	Other texture, other taste, other colour, other odour Etc.	Freshness Shelf life Standardisation Authenticity	Use of other additives Use of functional ingredients	Milk Meat Cereals Oils Apples

## 2.2 The selection of product groups

The aim of the project was to have a broad selection of relevant products from the main different product groups in each country, which are relevant for the involved SME-Associations as core partners in the project. The aim was to have as much as possible comparable products in each country. The final selection has been a result of a discussion process between the SME-AGs and involved companies and the research team.

Each country has the lead for one product group and does involve at least one national SME company, which produces such products.

The provisional list below is the state End of June 2009; this list might be adapted later in the project. The main focus is on processed products except for one or two product group (apples, potatoes). The countries mentioned below means that in these countries products of this product category will be provided for testing.

Dairy products:

- Yoghurt (natural and fruit yoghurts): NL, CH, IT, FR, PL, DE
- Yoghurt (vanilla yoghurts): CH, IT, FR, DE
- Yoghurt (full fat and low fat): NL,
- Soft cheese: CH

Bakery products

- Cookies (with different sweet taste): NL, CH, IT, FR, PL, DE

Meat products:

- Salami (bio and conv.): IT
- Salami (with or without glutamates)<sup>2</sup>: DE
- Salami (smoked): DE
- Salami (different nitrate/nitrite use): DE
- ev. smoked beef meat: DE
- Salami with yeast extract DE

<sup>2</sup> Glutamats for flavour enhancing is not allowed based on regulation (EC) 834/2007 for organic production: if products will be compared then it makes only sense to compare it with alternatives such as yeast extract.

Vegetable oils:

- Sunflower oil: NL, CH, DE, IT, FR?
- Rapeseed oil: CH, FR

Vegetables products

- Tomato sauce: NL, IT PL, DE

Fruit products:

- Apples: PL, IT, CH, DE
- Apple juice: FR
- Mixed juice with apples: NL

Other products:

- Potatoes: PL

**Table 2.1 ECROPOLIS WP 3.1 Product selection**

	Dairy products	Bakery products	Meat products	Vegetable oil	Tomato products	Apple/Juice	Flexible product group
<b>Netherlands</b>	Yoghurt Natural Yoghurt Full fat and low fat.	Cookies	Sausages Salami	Sunflower oil	Tomato sauce Selected by Fairconnect Passata, Sauce with different herbs	—	Mixed juice with apples
<b>Suisse</b>	Yoghurt 4 X Natural Yoghurt 4 X Fruit yoghurt e.g. with strawberry, raspberry	Cookies (Genuine-Spelt)	Salami  3 X organic 3 X conventional	Sunflower oil or Rapeseed oil	—	Apple	Soft Cheese: Camembert (Selected by Agrovision)
<b>Italy</b>	Yoghurt	Cookies (Forelinos)	Sausages: Salami	Sunflower oil	Tomato Sauce	Apple	
<b>France</b>	Yoghurt Natural Yoghurt If fruits → strawberry	Cookies e.g. less sweet with fruits possible	?	Rapeseed oil (sunflower oil also possible)	—	Apple juice (fruits also possible)	Not determined yet
<b>Poland</b>	Yoghurt Natural yoghurt	Cookies Spelt Cookies Oat Cookies Muesli Cookies Diet Cookies (added fibre) The cookies includes different sweetener and baking agents	—	—	Perhaps: Tomato Passata	Apples	Potatoes – not finally determined
<b>Germany</b>	Yoghurt	Cookies	Sausages Salami Pork/beef-meat With/without monosodium glutamat Smoked/air-dried Different regulations	Sunflower Oil	Tomato Sauce	Apple Juice	

## 2.3 The selection of relevant standards

The main focus of this analysis was on the specific requirements of public regulations and private standards for organic production which affect sensory properties.

The most important regulatory framework is the new Council Regulation (EC No 834/2007) and the related rules for implementation (EC No. 889/2008), which are analysed.

In addition, the most important private standards and governmental regulations for organic food and farming in the countries involved (CH, DE, FR, IT, NL; PL) were analysed, as some of these standards have additional requirements that may be relevant to sensory properties.

**Table 2.2 Selected regulations and standards in the ECROPOLIS project**

Level: country/ international	Governmental rules (more detailed or even stricter than EC Reg. 834/2007 & EC Reg. 889/2007	Private Standards	Other private requirements such as Code of Practise and binding guidelines, etc.
Germany		Bioland Association (2009)* Naturland Association (2008/2009)* Demeter Germany (2008/2009)*,**	Flavour guidelines of Association Naturkost (2008)
France	Governmental rules (these are phased out in 2009)	Nature & Progrès (2005)	Synabio-Charta (draft 2009)
Italy		AIAB (2002-2006)* Italian Organic Standard (2004)	
Netherlands		SKAL	
Poland		Ekoland	
Switzerland	Governmental rules	Bio Suisse (2009)* Demeter Switzerland (2008/2009)*	
Others:			BNN-Flavour guidelines
INTERATIONAL			
	Codex Alimentarius (2008)		
		IFOAM (2005)	
		Demeter International (2008/2009)*, **	

\* Standards include specific processing regulations

\*\* National Demeter Standards are based on the same international processing standards

One of the main data source for the analysis is the public standards database ([www.organicrules.org](http://www.organicrules.org)) developed by FiBL (in cooperation with ICRCOF, DK) in the EU funded FP6 project "EEC 2092/91 Revision ([www.organic-revision.org](http://www.organic-revision.org)). However the difficulty was that the analysed standards were from 2005/2006. At that time they were compared with the old EEC Regulation 2092/91. Therefore it was necessary to verify if in the meantime major changes of the content of the standards.

All these data were used to summarise the relevant standards requirements of the EU regulation for organic production along with additional requirements deriving from private standards for the selected product groups and products.



## 2.4 The state of knowledge on differences in regulations and standards

This report is building on work, which has been done already in other EU projects, in particular the Organic-Revision project ([www.organic-revision](http://www.organic-revision)) and the subproject processing in the Quality of Low Input Food project ([www.qlif.org](http://www qlif.org)).

As the main focus within this project is on processing standards, the main known issues related to differences in processing standards are summarised below.

### a. Historical development of processing standards

Schmid et al. (2004) analyse in a literature survey done in the QLIF-project on “Underlying Principles in Organic and Low-Input Food processing” the historical development of the standards and regulations, in particular related to processing<sup>3</sup>. In 1980 the first international standards have been developed by the International Federation of Organic Agricultural Movements (IFOAM) under the title Basic Standards. These standards were to guide national organizations in the development of their own standards. Since 1996 new editions also describe criteria for the evaluation of organic food processing, in particular with regard to the use of additives and processing aids.

Since 1985 several private label organizations and their umbrella organizations have been working on standards for processed organic food. In particular the organizations DEMETER, BIOLAND and NATURLAND (Germany) as well as BIO SUISSE (Switzerland), Nature & Progrès (France) and AIAB (Italy) but also Soil Association (United Kingdom, not represented in the project consortium), which even developed product specific standards.

The EU regulation 2092/91 came into force in 1991. It was completed in 1993 with a special Annex VI, listing the allowed additives and processing aids for the processing of organic food (EU regulation 207/93). Two new positive lists were established for ingredients of non-agricultural origin and for processing aids, and were several times amended later on.

The Codex Alimentarius Commission, a joint FAO/WHO Food Standards Program, started in 1991 to elaborate guidelines for the production, processing, labelling and marketing of organically produced food and in 2001 it finalized guidelines for organically produced food, including some criteria for the use of additives and processing aids in plant and animal products.

Despite the existence of the regulatory international and European framework for organic agriculture, there was since the last 10 years an ongoing discussion among the main actors about how to define “the processing of organically produced foods”.

Nowadays a number of different **private standards for the processing as well as state regulations** for organic foods are in place: the new updated EU regulations on organic production, the “National organic program” of the United States, the Codex Alimentarius “Guidelines for the production, processing, labelling and marketing of organically produced foods”. Parallel to the state regulatory framework for organic agriculture, many private business standards all around the world are introduced. The basis of most of those standards is given by the “Basic Standards” of the “International Federation of Organic Agriculture Movements” (IFOAM 2002). This international standard reflects to a certain extent a broad international agreement at the private level, concerning the signification and meaning of *organic* food and of *organic* food processing. All standards consist of positive lists of methods and inputs allowed. Most of the private standards are written in a language that can be understood quite easily by a majority of operators.

It can be summarized that most standards require a certified quality management system in place to ensure the “true labelling” of organic foods. There are different approaches with regard to the quality profile of the products. In all regulations the labelling provisions of the ingredients are very important.

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<sup>3</sup> Schmid, Otto; Beck, Alexander und Kretzschmar, Ursula, (Hrsg.) (2004) Underlying Principles in Organic and “Low-Input Food” Processing – Literature Survey. EU project Quality of Low Input Food (QLIF). QLIF/FiBL-Report. Research Institute of Organic Agriculture FiBL, Frick, Switzerland. <http://orgprints.org/3234/>

## b. Underlying principles

The analysis of different standards made by Schmid et al. (2004) in the QLIF Project report indicate a hierarchy regarding the underlying principles in organic food processing, as visualised in Figure 2.1.

The first basic principles, according to which ingredients of processed foods have to be of certified organic origin, in addition to the second principle, which requires a minimum of additives be used, constitute the fundament of the EU Regulations for organic labelling of food.

The use of terms *careful processing* and *freshness* is present in private standards and used by companies. These principles are shared by many actors of the private sector. The whole food approach (“Healthy nutrition”, “natural concepts of nutrition”) can also be found in the private sector, but its importance is decreasing. We have to recognize that pleasure and taste aspects are becoming more and more important also in the organic food sector. Furthermore one can now find organic functional dairy products labelled with their functional proprieties on the market.

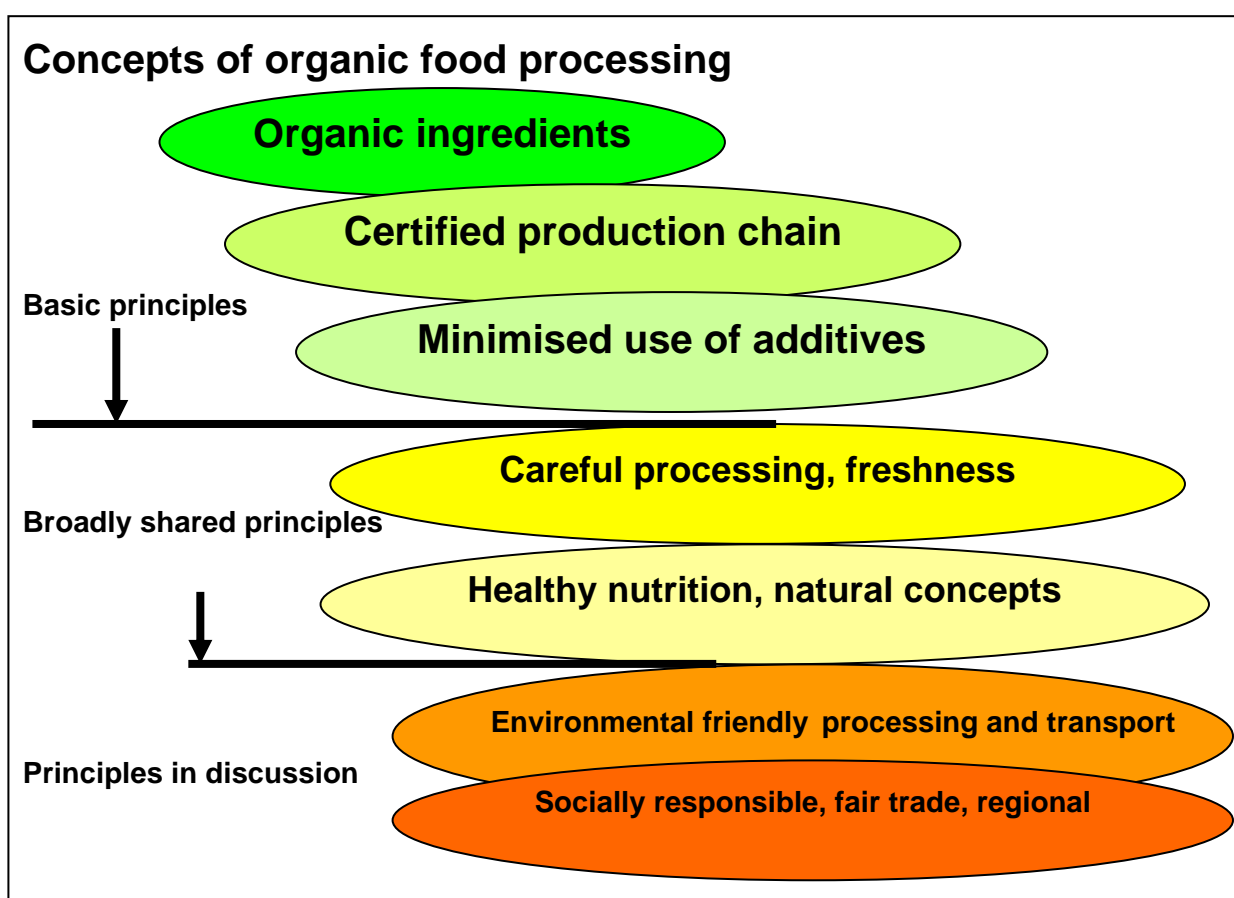


Figure 2.1 Overview of principles for organic food processing

As summarised in the above mentioned QLIF-Report only very few organic standard setting and label organizations in Europe (France, Germany and Switzerland) have **product specific private standards** in place (Schmid 2000). In the EU Regulation 2092/91 we do not find any indication for product group related specific standards. The IFOAM Basic standards mention no product specific approach in the processing area. It's interesting to see that organizations like the Soil Association, which had in former times, product group specific standards, have given up this concept or did not develop it further.

Beck (1998) gave an overview of the main differences between the EU Reg. 2092/91 and the existing product specific standards for the processing of organic foods on the private level at that time.

**Table 2.3 Main differences in the processing of organic foods: Comparison of EU Reg. 2092/91 and private business standards in 1998**

Area	Characteristics of EU Regulation 2092/91	Characteristics of product specific private standards
Product group specific requirements for additives and processing aids	Only restrictions for some additives and processing aids	In general product-related standards, partly orientated on specific applications
Requirements for enzymes	General allowed with the exception of GMO	Only some enzymes allowed for specific applications in some product groups*
Requirements for starter cultures	Generally allowed with the exception of GMO	Only some starter cultures allowed for specific applications in some product groups*
Requirements for natural flavours	General allowed with the exception of GMO	Not allowed or only for some products*
Regulation/standards for animal products	Only partly in place not regulated in Annex VI*	Standards developed in the same way as for plant products
Percentage of conventional ingredients	95% of certified organic ingredients 70% of organic ingredients are required with special labelling**	95% of certified organic ingredients are required, generally like 2092/91
Processing methods	No specific requirements with the exception of the inclusion of irradiation	Positive description of required methods and/or negative lists of processing methods not allowed
Packaging systems and materials	No specific requirements	Positive list of packaging materials

Materials from GMO origin are excluded

\* has been adapted in 2006

\*\* 70% labelling in the new regulation EC 834/2007 no more existing

These differences between the private standards and the EU rules still remain the same with the exception of the percentage rule for conventional ingredients.

### **b. Principles and criteria for organic food processing in the new EU rules for organic production**

A major step has been made in 2007 with the new Council EC Regulation 834/2007 on organic production, revising the EU Regulation (EEC) 2092/91, where principles for food processing as well as criteria for processing inputs have been set. See chapter 3.1.1.

Similar conclusions were made in the “Analysis of EEC Regulation 2092/91 in relation to other national and international organic standards” by Schmid et al. (2007):

“Detailed food processing standards for specific product groups have been elaborated by a few private standards setters (exclusion of certain processing methods like multiple pasteurisation of milk or no reconstitution of fruit juices with concentrates). Several national standards also have additional requirements for honey processing (such as limiting the maximum temperature allowed, etc.) and for wine processing.”

For the future development of the processing standards the following recommendations were made in the above mentioned report:

“The proposed principles and criteria for organic food processing in the recently adopted Council Regulation EC 834/2007 on organic production is an important step towards better harmonisation. However, it may be a problem, that according to the new Council Regulation it will no longer be allowed to restrict the use of some additives and processing aids, which are listed in Annex VI, in the national governmental organic rules, even though the necessity and suitability of using additives such as nitrates and nitrites is much debated, and it is possible to process organic animal food products without them.

The list of additives and processing aids should continuously be re-evaluated and restricted at both the international and the EU level. It should still be possible for governmental and private certifiers to restrict the number of additives and processing aids further at the national level for their domestic production for the sake of keeping the dynamics of the development of organic rules and consumer confidence. However the impact of stricter national rules has to be carefully assessed, avoiding the distortion of competition.

Regarding product-specific processing methods, there is not sufficient evidence from the Organic-Revision comparison report on which ones should be listed on a positive or negative list at the EU level. Processing rules for product groups which define in detail the processing technologies/methods, which may be used, may remain a development field for private standard-setting organisations and the organic food industry, e.g. by developing a common code of practice.”<sup>4</sup>

### c. Debated issues related to processing of specific product groups

Some issues, which were reported in the former QLIF Project by Schmid et al. (2004) are summarised below:

**The processing of organic fruits and vegetables** is regulated since a number of years by the EEC Reg. 2092/91 (now replaced by EC Reg. 834/2007 and implementation rules). In the organic vegetable sector inhibition of the browning reactions in fresh and dried products while processing is challenging, because sulphite compounds are not allowed for organic processing. Organic acids and enzymes may solve some problems, but they are not as effective as the sulphite compounds. In addition organic acids might be problematic at the organoleptic level, which is the reason why they aren't used at a larger scale at the moment. The use of ozone might be an option, and was studied in the QLIF Project.

Applicable enzymes can inhibit browning reactions and enzymes have an important role in the processing of fruits and berries. They can also be used in peeling processes. The fundamental problem here is whether we can guarantee that the enzymes used aren't produced by genetically modified organisms.

**The processing of cereal based organic products** is regulated since 1993 by the EEC Regulation 2092/91 (now replaced). However this EU rules do not address specific requirements for organic cereal processing; but rather draws up general requirements for plant products.

It is not common to encounter product specific standardization for the processing of organic cereal based food. Most private business standards do not have product specific requirements at all. The few standards which developed requirements for cereal based foods are dealing with the following principles: raw materials from certified organic origin; requirements and recommendations for storage; minimization of the use of additives and processing aids; the use of whole flour products are recommended; biological and traditional processing methods are preferred; processing methods are selectively restricted (for example extrusion); ecological and adapted pest management systems, cleaning regimes and packaging materials are enforced.

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<sup>4</sup> Schmid, O., Huber, B., Ziegler, K., Jespersen, L. M., Jens Gronbech Hansen, Plakolm, G., Gilbert, J., Lomann, S., Micheloni, C. and Padel, S. (2007) Comparison of the EEC Reg.2092/91 and selected national and international organic standards as regards compliance and identification of specific areas where harmonisation, regionalisation or simplification may be implemented in EEC 2092/91. EEC 2092/91 (Organic) Revision: Project report D 3.2. Forschungsinstitut Biologischer Landbau (FIBL). Frick.

There are a number of important questions, which have been discussed in the organic sector in relation to organic cereal products. These questions are addressing aspects of the evaluation of additives and technologies as well as the definition of underlying principles for the processing of cereal based foods in relation to nutrition styles, understanding of health, meaning of traditional processes or handicraft, as well as to the concept of regionality. New developments, e.g. organic starter cultures, demonstrate the possibilities for innovations adapted to the needs of the organic food sector.

The EU-Regulation 2091/92 has for a long time not addressed **dairy products**. They were regulated for the first time in 2006 by the EU Commission with EC Regulation 780/2006, which has been now been replaced by EC Regulation 889/2008.

Nowadays the processing of animal products is regulated by a wide range of different national standards and regulations.

Milk is a highly perishable food material and one must therefore have a good knowledge and understanding of the techniques used and of the complexity of microbial interactions. The challenges imposed by the tendency to go towards longer shelf life and higher food safety of products should not be achieved at the expense of e.g. their freshness. Concerning the microbiological quality and safety of dairy products, zero risk is not a reality and this fact should also be accepted by consumers. It would be necessary to provide consumers with more accurate information on food risks and to encourage behaviour modification where needed (like right storage temperatures). In addition to the minimal processing techniques which aim at maintaining the nutritional and vital quality of the product, some novel or combination of techniques and treatments could be considered (high temperature pasteurization, high pressure treatment, micro filtration etc.). Enzymes could offer many interesting applications in organic dairy industry if GMO –free enzymes were available. Organic dairy products and functional foods are also an interesting combination, because the best known functional foods at the moment are milk products fortified with probiotic bacteria. Moreover the CLA-content of organic milk seems to be naturally higher. So could there be “naturally” functional food products?

The EU-Regulation 2091/92 did for a long time also not deal with **meat products**. They were regulated for the first time in 2006 by the EU Commission with EC Regulation 780/2006, which has been now been replaced by EC Regulation 889/2008.

Similar to dairy products the processing of meat products is regulated by a wide range of different national standards and regulations. Some countries have very strict regulations on additives to organic meat products. But now with the new EC Regulation 889/2008 several Member States only apply now the EU rules for organic production.

Standard setting often involves a balance between maintaining the purity and integrity of the organic system and ensuring that certain quality demands are met. Especially for meat this dilemma has been clearly recognized.

Currently the most urgent challenge for the organic meat sector is to offer products with a high microbiological quality and safety without using critical additives like colouring agents or nitrite. The search for alternatives and alternative approaches to the use of nitrite in processed meat should be continued. Furthermore the discussion about security should be connected to entire life cycles of the products, including for instance appropriate storage temperatures and cooling requirements in retail shops.

### 3 Overview and analysis of regulations and standards affecting sensory properties

In the analysis a differentiation is made between the relevance of regulations and standards in the market place, the level (EU or national ev. regional) and the ownership (governmental regulation or private standards) as outlined in 2.2.

The main focus is on the two relevant EU regulations for organic production: Council Regulation (EC No 834/2007) and the related rules for implementation (EC No. 889/2008) which were analysed. This will be the basis for the comparison with national regulations and private standards, which are more detailed and/or more restrictive as the EU regulations.

#### a. Importance of strategic positioning as standard or differentiated product

The influence of the different requirements on sensory properties (texture, taste, odour, and appearance) can vary tremendously. This depends very much what the goal of the standard-setting body is.

- Is the goal to produce standardized products or special quality /differentiated products, or
- Is the goal to ensure a high authenticity or to produce products with long shelf-life and long storage?

This strategic positioning will determine very much the nature of the restrictions and in this way also the sensory properties.

The EU Regulations are from their objective much broader than for example Demeter Standards or other private standards (AIAB, Bio Suisse, Bioland, Naturland, Nature & Progrès) , which want to differentiate themselves from the EU regulations with more detailed and partly more restrictive standards (see Figure 3.1).

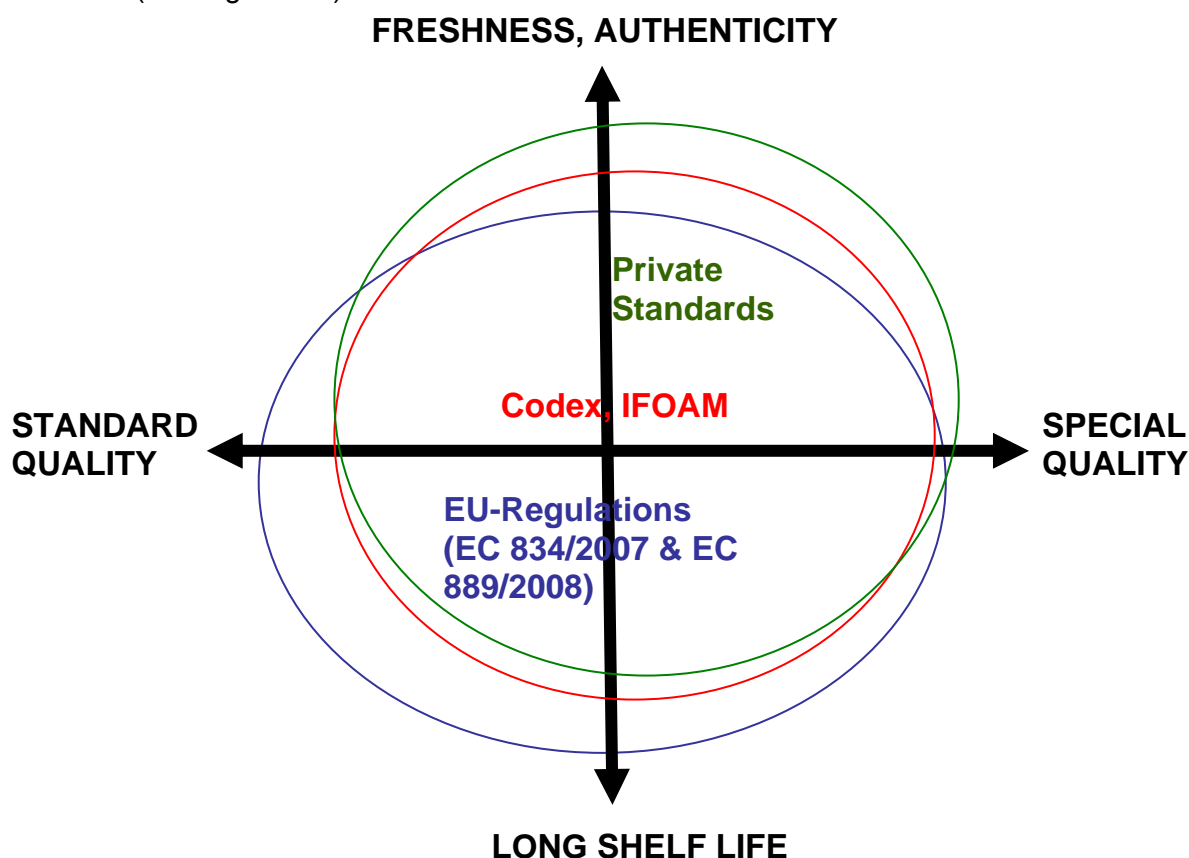
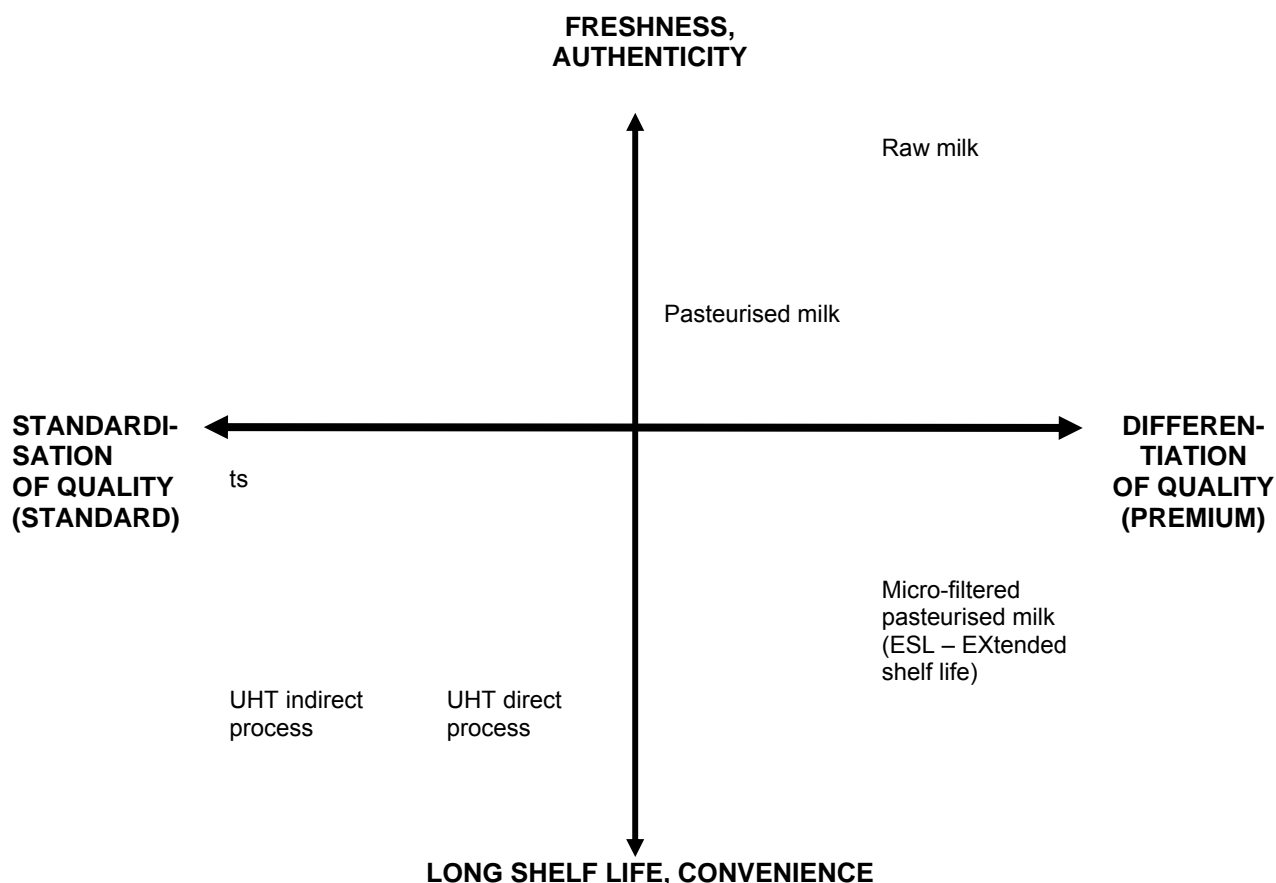


Figure 3.1 Classification of standards requirements related to different quality concepts

But also these private standards have to a certain extent to cover a range of products with long shelf life. Codex Alimentarius and IFOAM Basic Standards are a bit more restrictive regarding the use of some additives (e.g. nitrates/nitrites) than the EU rules.

Later in this report we will use this approach to classify also the different product group profiles. An example is already given below with different milk types for drinking to show how such a typology can be applied.



**Figure 3.1 Typology of processed organic products linked to differentiation/standardisation as well as to freshness/long shelf life – the example of milk for drinking**

This figure will be used in the chapter 5 for all main product groups as well as in the synthesis in chapter 6.

**b. Importance of country traditions in processing and consumption**

Although the EU Regulations for food in general and organic food in particular are the same, we should not underestimate the influence of specific traditions in the way products are processed and eaten.

Some well-known examples are described below:

- The use of different fermented and processed milk products has until now have often a higher relevance in Northern European countries, whereas traditionally fruit and vegetable products are very important and offered in more different qualities in the Southern European countries.
- Sausages play a more important role in the Central and Eastern European countries than for example in the South of Europe, whereas the choice for such sausages is smaller.

- Oils (in particular olive oils) play a very important role in the South whereas in the North of Europe more milk based fat is used.
- Fish products are more important in Western European seaside countries with strong fish industry whereas meat is more consumed in Central and Eastern Europe.
- In the South bread is more based on wheat whereas in the North of Europe there is a tradition for rye bread with sour dough.
- Use of thickeners in milk products: in some countries it is much more often that gelatine is used in milk products like yoghurt whereas in other countries it is a more likely that agar agar or other gum-based additives are used.
- Use of nitrates/nitrites in meat products: In Nordic countries like Denmark there are a strong opposition against nitrate/nitrite use mainly due to strong opposition of consumer organisations, where in other countries this was not a real consumer issue.

### **3.1 Regulations and standards for agricultural production and processing**

In the analysis a differentiation is made between the relevance of regulations and standards in the market place, the level (EU or national ev. regional) and the ownership (governmental regulation or private standards) as outlined in 2.2.

The main focus is on the two relevant EU regulations for organic production: Council Regulation (EC No 834/2007) and the related rules for implementation (EC No. 884/2008), which were analysed.

Furthermore the most relevant governmental regulations (if different from the EU Regulations on organic production) and more restrictive and detailed private standards than the EU rules in the five involved countries were analysed.

Practically all regulations and standards for organic food and farming consist of general principles and requirements (rules) as well as generally positive lists for acceptable processes and inputs.

Below a short description of regulations and standards is given, indicating areas of relevance for food quality and sensory properties.

#### **3.1.1 EU Regulations for organic production**

In June 2007 the Regulation EEC 2092/91 has been replaced by a new Council Regulation (EC No 834/2007) complemented with detailed rules for implementation, in particular the EU-Commission (EC) Regulation 889/2008 and their Annexes.

The most relevant requirements for the quality and sensory properties of products can be found in those areas, which deal with processing of products: In articles 6, 19 and 21 of the Council regulation and in particular in Article 21 and the list of additives and processing aids in Annex VIII of the EC Regulation 889/2008.

The Council Regulation (EC) 834/2007 includes for the first time a legal text governing the aims and principles for organic food processing. For example, the term “for specific nutritional purposes” has been included, to facilitate the inclusion of nutritional supplements used for dietetic products.<sup>5</sup>

In addition to the overall principles set out in Article 4, the production of processed organic food shall be based on the following specific principles:

<sup>5</sup> Beck, Alexander (2009): The impact of the new organic regulation on processors of organic food. In: Mikkelsen, C., Schlueter, M. (Eds). The New EU Regulation for Organic Food and Farming – Background, assessment and interpretation. Dossier. IFOAM EU Group. 36-41.



- (a) the production of organic food from organic agricultural ingredients, eXcept where an ingredient is not available on the market in organic form;
- (b) the restriction of the use of food additives, of non organic ingredients with mainly technological and sensory functions and of micronutrients and processing aids, so that they are used to a minimum eXtent and only in case of essential technological need or for particular nutritional purposes;
- (c) the exclusion of substances and processing methods that might be misleading regarding the true nature of the product;
- (d) the processing of food with care, preferably with the use of biological, mechanical and physical methods.

Article 19 (1 and 2) of EU Reg 834/2004 states, which products can be used in processing in which way.

1. The preparation of processed organic food shall be kept separate in time or space from non-organic food.
2. The following conditions shall apply to the composition of organic processed food:
  - (a) the product shall be produced mainly from ingredients of agricultural origin; in order to determine whether a product is produced mainly from ingredients of agricultural origin added water and cooking salt shall not be taken into account;
  - (b) only additives, processing aids, flavourings, water, salt, preparations of micro-organisms and enzymes, minerals, trace elements, vitamins, as well as amino acids and other micronutrients in foodstuffs for particular nutritional uses may be used, and only in so far as they have been authorised for use in organic production in accordance with Article 21;
  - (c) non-organic agricultural ingredients may be used only if they have been authorised for use in organic production in accordance with Article 21 or have been provisionally authorised by a Member State;
  - (d) an organic ingredient shall not be present together with the same ingredient in non-organic form or an ingredient in conversion;
  - (e) food produced from in-conversion crops shall contain only one crop ingredient of agricultural origin.

Based on Article 19 (3) the following substances or techniques may be prohibited in organic processing (reservation of prohibition):

3. Substances and techniques that reconstitute properties that are lost in the processing and storage of organic food, that correct the results of negligence in the processing of these products or that otherwise may be misleading as to the true nature of these products shall not be used.

Furthermore in Article 21 detailed criteria prescribe, which additives and processing aids can be accepted for organic food processing:

21.1. The authorisation of products and substances for use in organic production and their inclusion in a restricted list of the products and substances referred to in Article 19(2)(b) and (c) shall be subject to the objectives and principles laid down in Title II and the following criteria, which shall be evaluated as a whole:

- (i) alternatives authorised in accordance with this chapter are not available;
- (ii) without having recourse to them, it would be impossible to produce or preserve the food or to fulfil given dietary requirements provided for on the basis of the Community legislation.

In addition, the products and substances referred to in Article 19(2)(b) are to be found in nature and may have undergone only mechanical, physical, biological, enzymatic or microbial processes, eXcept where such products and substances from such sources are not available in sufficient quantities or qualities on the market.

Here is one of the cornerstones, why a whole range of additives and processing aids cannot be used, which of course influence sensory properties.

In Article 27 (1) of the implementing rules the main categories of permitted substances are described:

1. For the purpose of Article 19(2)(b) of Regulation (EC) No 834/2007, only the following substances can be used in the processing of organic food, with the exception of wine:
  - (a) substances listed in Annex VIII to this Regulation;
  - (b) preparations of micro-organisms and enzymes normally used in food processing;
  - (c) substances, and products as defined in Articles 1(2)(b)(i) and 1(2)(c) of Council Directive 88/388/EEC (14) labelled as natural flavouring substances or natural flavouring preparations, according to Articles 9(1)(d) and (2) of that Directive.
  - (d) Colours for stamping meat and eggshells in accordance with, respectively, Article 2(8) and Article 2(9) of European Parliament and Council Directive 94/36/EC (15);

- (e) drinking water and salt (with sodium chloride or potassium chloride as basic components) generally used in food processing;
- (f) minerals (trace elements included), vitamins, amino acids, and micronutrients, only authorised as far their use is legally required

In Annex VIII of the implementing rules the allowed additives and processing aids are listed. These are a limited number of substances per main category (Food acids, stabilisers, antioxidants, preservatives, baking agents, emulsifiers, thickeners, diluents). Based on the principles of organic agriculture the use of flavour enhancers, sweeteners and phosphates (with the exception of Mono Calcium phosphate for self-raising flour).

A few substances are specifically restricted within a time limit such as Sodium nitrite as well as Potassium nitrate for meat products, Sulphur dioxide as well as Potassium metabisulphite for fruit wines.

The use of microorganisms and enzymes, generally used in food processing, is also accepted in EU Regulation for organic production.

The use of salts and water is generally allowed. There are no further restrictions except the ones in the general food legislation.

### 3.1.2 Codex Alimentarius Guidelines

The Codex Alimentarius Commission is an intergovernmental body with over 170 members, within the framework of the Joint Food Standards Programme established by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), with the purpose of protecting the health of consumers and ensuring fair practices in the food trade. The Commission also promotes coordination of all food standards work undertaken by international governmental and non governmental organizations.

The Codex Alimentarius (Latin, meaning Food Law or Code) is the result of the Codex Commission's work: a collection of internationally adopted food standards, guidelines, codes of practice and other recommendations (see [www.codexalimentarius.net](http://www.codexalimentarius.net)).

Several Codex standards have been elaborated, which cover also the product groups used in this project (see Annex: List of Codex standards with links).

As already mentioned in Chapter 2.4 the Codex Committee on Food Labelling developed the *Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods*<sup>6</sup>. In view of the growing production and international trade in organically produced foods with a view to facilitating trade and preventing misleading claims. The *Guidelines* are intended to facilitate the harmonization of requirements for organic products at the international level, and may also provide assistance to governments wishing to establish national regulations in this area.

The European Union as well as the private world-wide umbrella organisation IFOAM (International Federation of Organic Agriculture Movements) has contributed much to the development of these guidelines.

The Codex Alimentarius Commission adopted the *Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods* at its 23rd Session in 1999, with the exception of the provisions for livestock and livestock products that were adopted at its 24th Session in 2001.

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<sup>6</sup> [http://www.Codexalimentarius.net/download/standards/360/CXG\\_032e.pdf](http://www.Codexalimentarius.net/download/standards/360/CXG_032e.pdf)

Related to the scope of the ECROPOLIS project, it is interesting that in the last year the main focus of the revision process of the Codex Organic guidelines in the area of processing was on developing criteria for the use of substances in processing (agreed in 2003).

5.1 At least the following criteria should be used for the purposes of amending the permitted substance lists referred to in Section 4. In using these criteria to evaluate new substances for use in organic production, countries should take into account all applicable statutory and regulatory provisions and make them available to other countries upon request.

Any proposals for the inclusion in Annex 2 of new substances must meet the following general criteria:

- i) they are consistent with principles of organic production as outlined in these Guidelines;
- ii) use of the substance is necessary/essential for its intended use;
- iii) manufacture, use and disposal of the substance do not result in, or contribute to, harmful effects on the environment;
- iv) they have the lowest negative impact on human or animal health and quality of life; and
- v) approved alternatives are not available in sufficient quantity and/or quality.

The above criteria are intended to be evaluated as a whole in order to protect the integrity of organic production. In addition, the following criteria should be applied in the evaluation process:

...

- c) if they are used as additives or processing aids in the preparation or preservation of the food :
    - these substances are used only if it has been shown that, without having recourse to them, it is impossible to:
      - produce or preserve the food, in the case of additives, or
      - produce the food, in the case of processing aids in the absence of other available technology that satisfies these Guidelines;
    - these substances are found in nature and may have undergone mechanical/physical processes (e.g. extraction, precipitation), biological/enzymatic processes and microbial processes (e.g. fermentation),
    - or, if these substances mentioned above are not available from such methods and technologies in sufficient quantities, then those substances that have been chemically synthesized may be considered for inclusion in exceptional circumstances;
    - their use maintains the authenticity of the product;
    - the consumer will not be deceived concerning the nature, substance and quality of the food;
    - the additives and processing aids do not detract from the overall quality of the product.
- In the evaluation process of substances for inclusion on lists all stakeholders should have the opportunity to be involved.

These criteria for the use of substances are very similar to the ones in the EU Regulation EC 834/2007 and the criteria in IFOAM Basic Standards.

Related to product handling, storage, transportation, processing and packaging the following principles have to be followed:

Annex I. 82. The integrity of the organic product must be maintained throughout the processing phase. This is achieved by the use of techniques appropriate to the specifics of the ingredients with careful processing methods limiting refining and the use of additives and processing aids. Ionizing radiation should not be used on organic products for the purpose of pest control, food preservation, elimination of pathogens or sanitation. Ethylene may be used for ripening of kiwifruit and bananas.

Annex I. Art. 86 Processing methods should be mechanical, physical or biological (such as fermentation and smoking) and minimize the use of non-agricultural ingredients and additives.

There are ongoing discussions on the use of ethylene for other fruits than banana and kiwi fruits.

These principles and the above mentioned criteria for substances was the basis for revising the list of substances for processing in line with the Codex Alimentarius systematic from 2004 until 2008. As a result a 35 page Annex list for ingredients of non-agricultural origin and processing aids was amended in 2007 (see table below).

**Table 3.1 Codex Alimentarius Guidelines of organically produced food- example of additive listing**

INS No.	Additive Name	Functional Use Allowed in Organic Production	Permitted for Use In Food Categories	
			Food of Plant Origin	Food of Animal Origin
333	Calcium Citrates	All	Permitted, although exclusions of the GSFA still apply.	01.0 Dairy products and analogues, excluding products of food category 02.0
334	Tartaric Acid	All	Permitted, although exclusions of the GSFA still apply.	Not permitted.
335i 335ii	Monosodium Tartrate Disodium Tartrate	All	05.0 Confectionery 07.2.1 Cakes	Not permitted.

However, the Codex Guidelines are not binding for governments; they give guidance for national regulations. These lists are therefore only indicative.

What is interesting that after intensive debates over many years in the Codex Committee in charge there was a consensus that the list of substances for organic food have to be very restrictive, responding to the current practise in private standards and the consumer expectations that processing is done with only few and as natural perceived substances.

As a result the request of some national members and of some industry representatives to list nitrates/nitrites (in combination with ascorbates) and the use of phosphates for milk products (like coffee cream or for melted cheese) was not accepted. One of the conclusions was that not every conventional product has to be made with an organic certification, as this would contradict with the more general principles of organic agriculture and organic food processing.

### 3.1.3 Governmental regulations

As a result of the new Council Regulation (EC) 834/2007, where the possibility of Regulation 2092/2091 was given that governmental regulations for organic farming could be stricter, in particular in the area of livestock production, several EU member States do not continue with own regulations like France.

However as a matter of fact there are still in the food regulatory area some national-specific regulations in place, which determine for example what additives, can be used in food processing. E.g. in Denmark the use of nitrates/nitrites in meat products was not allowed any more and therefore there was a strong resistance against allowing the use of nitrites in sausages in the EU Regulation for organic production.

#### a. France

France had very detailed regulations in the livestock sector including processing rules, which do not continue. Now only the EU Regulations for organic production are applied.

#### b. Germany

Only the EU Regulations for organic production are applied.

### c. Italy

In Italy the government is preparing an own decree for organic food and farming to come out in autumn 2009. It is planned to overtake the EU regulations for organic production. There is already a draft worked out, which will have two points more detailed than the EU Regulation 834/2007 and 889/2008:<sup>7</sup>

According to of paragraph 2 letter to) art. 19 of the Reg. (CE) n. 834/2007 for “*product obtained mainly from ingredients of agricultural origin*”, a product in which the ingredients of agricultural origin represent more of 50% in weight of the totality of the ingredients.

2) Use of the Sodium Nitrite and Potassium Nitrate in the processing of the products made up of meat - Attached VIII of the Reg. (CE) n. 889/08

According to the attached Annex VIII of the Reg. (CE) n. 889/08 the use of Sodium nitrite and Potassium nitrate for the transformation of the products made up of meat, is authorized from the MiPAAF (Ministry of Agriculture) in case it has been demonstrated, in satisfactory way, that some alternative technological methods in a position to offering the same guarantees and/or of maintain the peculiar characteristics of the product does not exist.

In exception to what is established from the cited community disposition and waiting for re-examination previewed to the art. 27 paragraph 3 letter to of the Reg. 889/2008, the use of the Sodium nitrite and Potassium nitrate is authorized, in the respect of the placed specific conditions from the regulations, without the obligation of some demonstration from part of the operator who means to use them.

The indicated exception on is not applied for the production of ham with bone and “culatelli”. In such case, the operator who means to resort to the use of Sodium nitrite and Potassium nitrate, is held to supply to the adequate MiPAAF demonstration approximately the non-existence of an alternative technological method, in a position to offering the same guarantees and/or of maintain the peculiar characteristics of the product.

### d. Netherlands

In the Netherlands the government does fully apply the EU regulations for organic production. There are only a few areas, where there is a different interpretation in the certification process: Liquid smoke and ion eXchange resins are not acceptable in the Netherlands for organic products.<sup>8</sup>

### e. Poland

In Poland the EU regulations for organic production are fully applied. There is no governmental additional rules for organic farming and processing in Poland.<sup>9</sup>

### f. Switzerland

In Switzerland there is a governmental regulation for organic farming since 1996 in place, which is equivalent to the EU Regulations for organic production; therefore Switzerland is listed on the Third Country list of the European Union, as the control body has been recognised as applying EU organic standards.

In the area of processing there a few minor differences: for example was the processing of wine already taken up by allowing the use of sulfites.

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<sup>7</sup> Personal communication R. Coozo, Bioagricoop, member of ECROPOLIS project from Italy

<sup>8</sup> Personal communication Bavo van den Idsert, VBP, Netherlands

<sup>9</sup> Personal communication Sylwia Zakowsky-Biemans, member of ECROPOLIS project from Poland.

### 3.1.4 Private national standards

For the purpose of the project only those standards were selected, which are relevant in the participating countries in the ECROPOLIS project.

Several of these standards have also detailed processing standards. These cover a broad range of product groups.

The following Table 3.1 gives an overview, which private standards have specific processing standards

**Table 3.1 Overview on product specific processing standards of countries involved in ECROPOLIS project**

Area	Bio Suisse-CH	Bioland - DE	Naturland-DE	AiAB-IT	Nature & Progrès France	Demeter CH, DE, IT, NL, FR, int	Others:
Milk and milk products	X	X	X	X	X	X	
Meat and meat products	X	X	X	?	X	X	
Egg and egg products	X	X	-	?	X	X	
Bread and bakery products	X	X	X	X	X	X	
Other cereal products	X	X	X	X	-	X	
Soya products	-	X	-	-	-	-	
Other arable products like potatoes	X	X	X	?	-	X	
Fruit and vegetable products	X	X	X	X	X	X	
Oil and fat products	X	X	X	X	X	X	
Herbs, soup, sauces, etc.	X	X	X	X		X	
Alcoholics (inc. wine, beer) and vinegar	X	X	X	X	X	X	
Wine	X	X	X	X	X	X	
Fish products	-	-	X	-	-	-	
Honey products	X	X	X	-	-	X	
Yeast	X	X	X	-	-	X	
Algae products	-	-	X	-	-	X	
Gastronomy	X	X	X	X	X	X	

#### AiAB- Italy

The Italian Association for Organic Agriculture (AiAB) was initiated in 1982 as an informal interest group and officially established in 1988. It gathers around 15.000 members (farmers, processors, experts, researchers and consumers) and up to 2000 was the main inspection and certification body for organic farming in Italy.

AiAB has several product specific standards; however they are relatively old and have not been revised in the light of the new EU rules for organic production.

The AIAB processing standards differentiate themselves in the following points from the EU Regulations for organic production<sup>10</sup>:

- More than 10 product specific processing standards were developed. *The EU rules have no detailed product specific standards. Only in few cases, based on Appendix VIII of the regulation 889/2008, additional restriction for the use of ingredients, additives and auxiliary substances related to individual groups of products or specific purposes are mentioned.*
- Some processing methods, where consumer concerns exist, are excluded or restricted in the product-specific standards. (e. g. prohibition of fruit juices from fruit juice concentrates, etc.): *The EU rules do not regulate yet specific processing methods with the exception of the exclusion of irradiation.*
- Positive list of permissible food additives is relatively short and restricted to specific purposes and product groups.
- *More general positive list of permissible food additives. EU processors can use 48 different additives*
- AIAB does allow flavouring products for specific product groups but only from physical extraction processes; however they must be mentioned on the label.<sup>11</sup>  
*The EU rules contain a general permission for natural flavourings and enzymes.*

Furthermore within AIAB since some years the discussion about "sensorial quality and organic food" has started. The process has begun considering how to include that in the standards, especially for wine and olive oil that already have a "qualitative assessment" before getting to the market (in the case on extra-virgin oil they must be evaluated by a panel and in the case on AOC wine it is almost the same). IFOAM tried as well on fresh fruit and vegetable but it was even more difficult! Instead two tools were developed with 2 aims:

- To promote sensorial quality among organic products= insist on the fact that organic must be good and even better than conventional food. That more aimed at the producer
- To demonstrate to the non-organic sector that organic can be as good as conventional and potentially better.

The tools AIAB tries to put into action are:

- awards (on wine, olive oil, honey etc.) among organic products but evaluated by "conventional" systems and sometimes even competing with conventional products (i.e. Biodivino where panels are blind)
- Local variety use for fresh products and pasta+ bread (this is quite successful)<sup>12</sup>.

## Bioagricert – Italy

Bioagricert<sup>13</sup> is an inspection and certification body, seated in Italy but acting world-wide.

Bioagricert is IFOAM accredited for voluntary norms that are stricter than the ones stated by the Reg.CEE 2092/91 (now replaced by EC Reg. 834/2007 and their implementation rules).

Bioagricert, because some products were excluded from the community regulation for organic farming, offers international and voluntary certification services for aquaculture, catering, textile and cosmetic on the basis of private standards marked by the trademark of conformity: Bioagricert International.

For some costumers Bioagricert applies the Italian Organic Standard (IOS), which is based on the IFOAM Basic Standards for Organic Production and Processing. These consist of 3 standards, one for crop production, one for livestock and one for processing.

The most relevant standard for this project are the IOS processing standards.<sup>14</sup> These standards do not have detailed standards for product groups. The content is very similar like IFOAM Basic

<sup>10</sup> [http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet\\_richtlinien/standards\\_for\\_processing\\_.zip](http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/standards_for_processing_.zip)

<sup>11</sup> [http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet\\_richtlinien/Merkblatt\\_Einsatz\\_von\\_Aromen\\_in\\_Biolandprodukten.pdf](http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/Merkblatt_Einsatz_von_Aromen_in_Biolandprodukten.pdf)

<sup>12</sup> Personal communication Cristina Micheloni, AIAB.

<sup>13</sup> <http://www.bioagricert.org/english/index.php>

Standards. The list with additives and processing aids is similar with the one of the EU Regulation for organic food and farming EC 889/2008. However there are a few substances like nitrite/nitrate and ascorbates, which are not listed in the Italian Organic Standard.

## Bio Suisse – Switzerland

Bio Suisse is the largest organic producer organisation and standard setting body in Switzerland, founded in 1981, with own standards in different areas.

Bio Suisse has since many years detailed processing standards which cover different product groups. The Bio Suisse standards stipulate that products with the Bio Suisse logo must be produced with careful methods. The processing must be exclusively mechanical, physical or through thermisation or fermentation. Combinations of the permitted methods are allowed. An unnecessary processing of Bio Suisse products as well as the production from isolated nutritional substances is not allowed. Processing methods with ionizing rays and microwaves are principally forbidden.

Like other standards with high and detailed requirements Bio Suisse Standards differentiate themselves from the EU regulations on organic production in the following points.

- Processing standards for the main product groups do exist.  
*The EU rules do not have specific product group standards.*
- The standards have a positive list of allowed processing methods and a list of excluded methods (e.g. like no reconstitution of fruit juices). In other cases some critical processing methods must be labelled (e.g. extrusion):  
*The EU rules do not regulate yet specific processing methods with the exception of the exclusion of irradiation.*
- Positive list of permissible food additives is a smaller than Regulation 889/2008 and is restrictive regarding its application. Several additives like Ascorbic acids, colorants, thickeners are not allowed.  
*The EU rules contain more general positive lists of permissible food additives and processing aids.*
- Both the use of nature-identical flavours as well as the use of natural flavourings extracted from organic raw materials is prohibited with the aim not to mislead consumers.  
*The EU rules contain a general permission for natural flavourings, but which can also be nature-identical.*

## Bioland - Germany

Bioland is the largest and one of the old standard-setting body and organic producer organisation in Germany, which started in the 70ties, with an association with own standards and an own logo.

Bioland has very detailed standards in many different areas.

The Bioland processing standards differentiate themselves in the following points from the EU Regulations for organic production<sup>15</sup>:

- Altogether 15 different processing standards specific to product groups, have been elaborated.  
*The EU rules have no detailed product specific standards. Only in few cases, based on Appendix VIII of the regulation 889/2008, additional restriction for the use of ingredients, additives and auxiliary substances related to individual groups of products or specific purposes are mentioned.*
- Some processing methods, where consumer concerns exist, are excluded or restricted in the product-specific standards. (e. g. prohibition of fruit juices from fruit juice concentrates, etc.):

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<sup>14</sup> <http://www.bioagricert.org/english/files/IOS%20Processing.pdf>

<sup>15</sup> [http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet\\_richtlinien/standards\\_for\\_processing\\_.zip](http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/standards_for_processing_.zip)



*The EU rules do not regulate yet specific processing methods with the exception of the exclusion of irradiation.*

- Positive list of permissible food additives is much shorter and restricted to specific purposes and product groups. Bioland allows less than half (21) of the permissible EU additives (48). *More general positive list of permissible food additives. EU processors can use 48 different additives*
- Restrictive requirements related to use of natural flavourings for specific product groups have been worked out groups<sup>16</sup>.  
*The EU rules contain a general permission for natural flavourings and enzymes.*

## **Naturland - Germany**

Naturland is an important standard-setting body and organic producer organisation in Germany, founded in 1982, which acts also internationally, mainly with fair trade organic products. They have very detailed standards in many different areas.

The Naturland processing standards differentiate themselves in the following points from the EU Regulations for organic production<sup>17</sup>:

- Processing standards specific to certain product groups, e. g. comprehensive and detailed processing standards for milk and dairy products, meat and meat products.  
*The EU rules, in particular Appendix VIII of the regulation govern the ingredients, additives and auxiliary substances permitted. Per-mission is general: only in isolated cases is permission for ingredients, additives and auxiliary substances restricted to individual groups of products or specific purposes*
- Regulations on processing with particular reference to permissible processing methods (e. g. prohibition of sterilisation of dairy products, injection salting of fish produce, fruit juices from fruit juice concentrates, exclusion of microwaves, etc.):  
*The EU rules do not regulate yet specific processing methods with the exception of the exclusion of irradiation.*
- Positive list of permissible food additives is much shorter and restricted to specific purposes and product groups. Naturland allows less than half (21) of the permissible EU additives (48). *More general positive list of permissible food additives. EU processors can use 48 different additives*
- Restrictive permission to use natural flavourings and enzymes specific to specific product groups.  
*The EU rules contain a general permission for natural flavourings.*

## **Nature & Progrès, France**

Nature & Progrès is an association of consumer and professionals in agriculture in one organisation. Since 1972 standards exist, which have been further developed for different areas. They also influenced strongly the first IFOAM Basic Standards.

For food processing specific requirements<sup>18</sup> exist for the following processed product groups exist: Cereals, fruits and vegetables, soups and sauces, milk, eggs, meat.

The Nature & Progrès processing standards differ in some areas from the EU Regulations for organic production:

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<sup>16</sup>[http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet\\_richtlinien/Merkblatt\\_Einsatz\\_von\\_Aromen\\_in\\_Biolandprodukten.pdf](http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/Merkblatt_Einsatz_von_Aromen_in_Biolandprodukten.pdf)

<sup>17</sup> [http://www.naturland.de/fileadmin/MDB/documents/Richtlinien\\_englisch/RiLi\\_Vergleich\\_Naturland-EU\\_2008-11\\_engl.pdf](http://www.naturland.de/fileadmin/MDB/documents/Richtlinien_englisch/RiLi_Vergleich_Naturland-EU_2008-11_engl.pdf)

<sup>18</sup> <http://www.natureetprogres.org/servicepro/sp42.pdf>

- Processing standards for the main product groups do exist.  
*The EU rules do not have specific product group standards.*
- The standards have a positive list of allowed processing methods and a list of excluded methods; Nature & Progrès is emphasising the more handcraft oriented ways of processing in contrast to industrial processing:  
*The EU rules do not regulate yet specific processing methods with the exception of the exclusion of irradiation.*
- Positive list of permissible food additives is a smaller than Regulation 889/2008 and is restrictive regarding it's application  
*The EU rules contain more general positive lists of permissible food additives and processing aids.*
- Natural flavourings should be extracted from organic raw materials.  
*The EU rules contain a general permission for natural flavourings, but which can also be nature-identical.*

Beside Nature & Progrès standards emphasise the social and environmental issues explicitly.

### **SKAL – Netherlands**

Skal<sup>19</sup> is a private non profit foundation with a public task as certification and inspection body for the organic production in The Netherlands. For this task they were assigned and recognized by the Dutch Ministry of Agriculture, Food Quality and Nature. Whereas SKAL had long time own standards, in 2009 only the EU Regulations for organic production is inspected.

### **EKOLAND – Poland**

The Association of Organic Food Producers (EKOLAND) was founded in 1989 and represents a farmer's association engaging in organic production in Poland (Sector Kujawsko-Pomorski). Since 1994, EKOLAND has their private organic standards, but no detailed processing standards.<sup>20</sup> In 2009 there are also no other private standards for processing in Poland.

### **Demeter – France, Germany, Netherlands, Switzerland, Poland**

Demeter has in all involved countries strong national organisations with own standards but the same logo. As practically all national standards fulfil the International Demeter Standards, in particular the processing standards, there is no differentiation made. See Demeter International.

### **Soil Association – United Kingdom**

Although there is no project partner from the United Kingdom is not member of the ECROPOLIS Project, the private standards of the biggest and most important standard setting organisation of the United Kingdom of Soil Association has to be mentioned. Soil Association<sup>21</sup> was founded already in 1946 and has since 1967 very detailed standards for all areas, for production as well as processing. Their well formulated detailed standards influenced the first IFOAM Basic Standards.

As many products are traded to the United Kingdom under the Soil Association Symbol it is important to know that in particular with regard to the use of additives, their standards are more restrictive (e.g. no nitrates/nitrites in meat products).

<sup>19</sup> <http://www.skal.nl/English/OrganisationSkal/tabid/113/Default.aspx>

<sup>20</sup> Organicrules database: <http://organicrules.org/custom/countrystandard.php?id=163>

<sup>21</sup> <http://www.soilassociation.org/>

In Annex I of this report a detailed short description of allowed additives and processing aids is given, which is very informative and explains also often the source and functionality of these substances. Therefore this information for consumers from the Soil Association Website has been taken up in this report.

### 3.1.5 International private standards and guidelines

#### IFOAM Basic Standards

The International Federation of Organic Agriculture Movement (IFOAM), founded in 1972, is the world wide umbrella organisation for organic agriculture representing more than 500 organisations in more than 100 countries. Since 1977 common standards were developed (on the basis of existing standards, e.g. from Nature & Progrès, Soil Association, Bio Suisse and Demeter) and in 1980 for the first time published. Since then they have been regularly revised every 2-3 years. The IFOAM Basic Standards - together with the IFOAM Accreditation Criteria - constitute the IFOAM Norms, which provide a framework for certification bodies and standard-setting organizations worldwide to develop their own certification standards; the IFOAM Norms are often referred to as 'standards for standards.' In close cooperation and consultation with IFOAM member organizations and other stakeholders, the IFOAM Standards Committee develops the IBS. The IFOAM Basic Standards are presented as general principles, recommendations, basic standards and derogations.

In 2005, the General Assembly of IFOAM adopted the four overarching Principles of Organic Agriculture, - the principles of health, ecology, fairness and care.

The IFOAM Basic Standards have since many years processing standards with a detailed list of additives and processing aids. This list is similar with the one of the EU Regulation for organic food and farming.

However there are a few substances like nitrite/nitrate and ascorbates, which are not listed in the IFOAM Basic Standards.

For the evaluation of substances for processing IFOAM has developed detailed criteria, which have been also overtaken by Codex Alimentarius in their Organic Guidelines.

#### Demeter International

Demeter is the only ecological association that has built up a network of individual certification organisations world-wide. In 1997 Demeter-International was founded for closer co-operation in the legal, economic and spiritual spheres. Presently in 2009 Demeter International has 16 member organisations from Europe, America, Africa and New Zealand.<sup>22</sup>

Demeter International is the umbrella organisation of the national Demeter organisations with their own standards but which are equivalent to the International standard.

Demeter International has beside production standards very detailed standards for food processing.

The Demeter processing standards differentiate themselves in the following points from the EU Regulations for organic production:

- Processing standards for the main product groups do exist.  
*The EU rules do not have specific product group standards.*
- The standards rule on a product-group level acceptable processing methods:  
*The EU rules do not regulate yet specific processing methods with the exception of the exclusion of irradiation.*
- Positive list of permissible food additives is much shorter and restricted to specific purposes and product groups.

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<sup>22</sup> <http://demeter.net/procedures/>

*The EU rules contain more general positive lists of permissible food additives and processing aids.*

- Restrictive permission to use natural flavourings and enzymes specific to specific product groups.

*The EU rules contain a general permission for natural flavourings.*

A strong emphasis is made on:

- the inner quality of products, which tries not only to maintain the high nutritional quality but also the forces contained in the food.

The international standards are the basis for national Demeter Standards and the use of the DEMETER trademark and related trademarks. Small exemptions can be given following through an Accreditation Board.

### **3.1.6 Other private codes of practice or recommendations**

Some retailers and private companies have their own internal guidelines or recommendations for processing to ensure a high nutritional and sensorial quality.

Also some umbrella organisation for organic food processors and retailers have developed recommendations for organic food processing like BNN in Germany and Synabio in France.

The author had also insight in private company guidelines for organic processing, which the firms did not want to be published due to market competition. These ideas have been taken up more generally when referring to the state of debate.

#### **BNN - Bundesverband Naturkost Germany**

The BNN (National Association for Production and Trade in Whole foods) in Germany is supporting the specialised retailers for organic food.

In 2004 adopted a recommendation regarding the production and trade in flavoured products. According to this, organic food, flavour extracts or essential oils shall be given priority as flavouring, in the future.<sup>23</sup>

#### **Synabio - France**

Synabio<sup>24</sup>, created in 1976, is a national professional organisation recognized by authorities dedicated to organic food processing companies and wholesalers. SYNABIO represents and defends food processing firms and wholesalers, covering all their downstream operations, from food processing, importation until finished or semi-finished products' wholesales.

Synabio has developed recommendations for the implementation of the processing rules of the EU Regulations for organic production and is engaged in the development of a Code of Practice within a European initiative, collaborating with the IFOAM EU Sector Group for organic processors on European level. The idea is to develop a self-assessment tool for enterprises, taking account of the underlying principles of organic food and farming.<sup>25</sup>

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<sup>23</sup> [http://www.bnn-monitoring.de/n-bnn.de/phpserve/input/downloads/Flavours\\_%20background\\_04\\_07.pdf](http://www.bnn-monitoring.de/n-bnn.de/phpserve/input/downloads/Flavours_%20background_04_07.pdf)

<sup>24</sup> <http://www.synabio.com/nos-missions.html>

<sup>25</sup> More information: <http://www.synabio.com/nos-positions.html> and <http://www.synabio.com/developpement-durable.html>

Furthermore Synabio has published a dossier on the impact of organic food processing requirements on the nutritional quality of food.<sup>26</sup>

### **AoEL - Germany**

The Association of Organic Food Producers (Assoziation ökologischer Lebensmittelhersteller - AoEL)<sup>27</sup> is a coming together from within the food industry of processing companies that produce organic food. The Association has members in Germany and across Europe. It's aim is to pool the interests of these members and to represent them in dealings with other organisations and on the political stage.

AoEL has no standards or guidelines for organic food processing, but instead regularly is publishing comments and press releases related to issues of food processing in general and in particular in organic food processing. AoEL is an active member of the IFOAM EU Sector Group for organic processors.

### **VPB – Netherlands**

VPB is a Dutch processing and trading association in organic product, founded in 2002, member of the ECROPOLIS Project. Within VPB (70 members) is working mostly on quality issues, like research-projects, BIOKAP residu-monitoring ([www.biokap.com](http://www.biokap.com)), market development and sustainability in the whole chain.

VPB has no own standards but makes recommendations for the implementation of the EU rules in processing and trade to their members.

Like AoEL VPB member of the IFOAM EU Sector Group for organic processors, working on a common Code of Practise.

## **3.2 Potential impact factors of standards requirements on sensory properties.**

In order to identify potential impact factors relevant in standards a hypothetical impact matrix was elaborated based on knowledge of experts in the project consortium and the literature review in WP1. During the project the impact of specific standards requirements will be tested and verified.

The Table 3.2 is a starting point of reflection, in which way certain restrictions in standards might have an impact on sensory properties based on expert knowledge. These impacts would have to be verified by empirical testing, where relevant in the ECROPOLIS-Project.

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<sup>26</sup> Report summary in French: <http://www.synabio.com/doc/synabio-doc-59.pdf>

<sup>27</sup> <http://www.aoel.org/en/index.html>

**Table 3.2 Potential direct impact matrix of selected standards requirements on factors influencing sensory properties**

	Issues	Criteria	Direct impact on sensory properties				Other impacts e.g. shelf life
			texture	flavour		appear-ance	
				taste	odour		
Use and origin of ingredients	Organic and non-organic ingredients	Use or non-use of organic ingredients	XX	XX	XX	XX	
		Use or non-use of non-organic ingredients	X	XX	XX	XX	
		Use or non use of functional ingredients (e.g. milk protein)	XX	X	X	X	
		Use or reduction of sugar	-	X	-	-	X
	Non-agricultural ingredients	Use salt and water,	-	XX	-	X	shelf life
	Other issues	Use or non-use of colouring ingredients	-	-	-	XX	
		Use of extracts for flavour	-	XX	XX	-	
Use of additives	Restrictions	Lower amount of sulfites or nitrates/nitrites (e.g. for meat)	-	XX	X	(X)	
	Use or non-use	ascorbic acid	-	(X)	-	X	
		antioxidants <sup>28</sup>	-	(X)	-	X	
		Colorants	-	-	-	XX	
Use of processing aids and other substances		non-use of GMO and derivatives	-	-	-	-	
	Other substances	Use or non-use of Ion exchange resins	-	XX	-	XX	
		Use or non-use of natural flavours	-	XX	XX	-	
		Use or non-use of organic yeast	-X	-X	-	-	
		Use or non-use of bacterial starters	-	X	X	-	
Processing methods	Restrictions	Heat/pressure restrictions	XX	XX	-	-	shelf life
	Non-use/prohibition	Irradiation	-	?	-	-	shelf life
		Micro-waves	-	?	-	-	shelf life?
		No homogenisation	XX	X	-	XX	
	Other issues	Reconstitution	X	XX	-	-	
Over-processing (e.g. double pasteurisation)		(X)	X	-	-	shelf life	
Packaging	Restrictions	Non-allowance of double packaging	-	-	-	-	packaging design
	Non-use/prohibition	Restricted use of certain packaging materials.	-	-	-	-	
Storage	Storage requirements	Restricted methods: Cooling, deep-freezing, Drying, regulation of water content, controlled atmosphere	X	X	-	-X	shelf life
Transport	Max. transport time for raw products	Milk collection	-	X	-	-	
	Animal transport	Max. transportation	-	-	-	-	
		Reduction of stress	-X	-	-	-	

X weak impact

XX strong impact

<sup>28</sup> Antioxidants are permitted in the EU organic rules e.g. E306 Tocopherol for fats and oils

The different impact factors on sensory properties of organic products are described more in detail below.

#### **a. Use of ingredients of agricultural origin**

##### ***Use of ingredients of agricultural origin***

With the new revised EU regulations for organic production there is a clear requirement to use organic certified ingredients. A multi-composed or mixed product has to have minimum 95% of ingredients from organic production with the exception of salt and water.

Only few exceptions are possible, when an ingredient is not available on the market as organic (Art. 6a, EC Reg. 834/2007). In EC Reg 889/2008 Annex IX are those ingredients listed, which still can be used from conventional production.

##### *Differences found of potential relevance:*

A few standard setting organisations like Demeter and Nature & Progrès as well as some private companies require 100% certified ingredients for a multi-ingredient product. They justify this strict rule to ensure the integrity of the organic production and minimize the use of contaminants.

This issue was debated in the last years very much and has contributed that the EU rules did get stricter in the new rules from 2009 on by striking the 70% rule (which allowed in the past for example a product like Muesli with 70% organic ingredients to be specially labelled)

##### *Link to sensory properties:*

There is little evidence that regarding sensory properties there might be differences found between a 100% organic and a 95% organic product.

##### ***Geographical origin of ingredients of agricultural origin***

The new EU rules do not request that an organic product has to be made preferably from local production. However consumers should get a better choice with the introduction of a labelling system for EU and non-EU products (although the implementation of these requirements poses problems in practise for multi-ingredient products).

##### *Differences found of potential relevance:*

None of the private standards explicitly give directly in their standards preference to local production with the exception of Bio Suisse (and recently also partially Soil Association), which exclude transportation of the products by airplane for environmental and image reasons. Some companies give in their internal guidelines preference to domestic (local) products, when economically feasible.

##### *Link to sensory properties:*

It can be assumed that local, domestic products can guarantee a higher degree of freshness if appropriately handled. But this might depend very much of the type of product and the way it is conserved and transported. This would have to be verified.

##### ***High quality requirements for raw materials***

The EU rules are referring to good agricultural practises. However there is no specific quality requirements found in the regulation, although it is assumed that organic farming aims "at producing products of high quality"(as stated in Art 4c in the EC Regulation 834/2007).

##### *Differences found of potential relevance:*

Very little requirements are found to ensure the highest quality of the raw materials and to ensure good sensory properties. The reason might be that already the European food safety requirements are relatively strict, at least to exclude risky raw materials.

The following examples were found:

- Bio Suisse restricts the use of concentrates in the food ration of ruminants to max. 10% dry matter content of the whole feed. They had justified this by the physiology of ruminants, which mainly feeds on roughage and not on concentrates. However this does not necessarily mean that the animals will graze on more flower rich pastures, which could be beneficial for the quality.
- Nature & Progrès restricts the feeding of silage in their standards.

This issue of feeding might gain again an importance on one hand from an animal welfare perspective and on the other hand from a climate gas problem perspective (where ruminants contribute significantly to methane emissions).

*Link to sensory properties:*

For some product groups the above mentioned restrictions can but must not in all cases have a clear impact on sensory properties:

- Milk: the way cows are fed (e.g. mostly on flower-rich meadows, which could contribute to higher content of Omega III fatty acids) and even flavour-relevant compounds.
- Cheese: for many hard cheese types (like Emmentaler) the use of silage is forbidden or strictly limited to ensure high quality and avoid risks with bad fermentations.
- Pig and poultry meat: the composition of the feed mixtures, in particular how the protein needs are covered when no synthetic amino acids can be used.

### ***Pre-frozen ingredients for further processing:***

Whereas the EU Regulations for organic production does not limit the origin of the ingredients, some standards have additional restrictions to avoid over-processing.

*Differences found of potential relevance:*

- Nature & Progrès does not allow deep freezing of compounds for further processing, whereas
- Bio Suisse at least wants that this has to be labelled (as this is not required by Swiss Food Law).

The issue is currently in 2009 not an issue for debate.

*Link to sensory properties:*

- The impact of excluding deep-freezing of compounds on sensory properties would have to be verified (e.g. of milk or fruit compounds in juices or yoghurt).

### ***Use of sugar or other sweet ingredients (like honey)***

The EU rules for organic production only require that sweetening ingredients like sugar or honey are certified organic.

*Differences found of potential relevance:*

Demeter and partly Nature & Progrès has a special standard for sugar products, defining the rules plant syrups (i.e. maple and sugar beets syrups), plant juice concentrates and plant extracts, sweetening agents from grains/starch, malt extract, and whole sugar (dried and milled sugar juice). The use of white sugar needs a special permission. Saccharine, even bio-quality, should be avoided and wherever possible be replaced by the above mentioned sugar types.

Some companies, who follow a more “whole food/healthy nutrition” approach, have the following preferences:

1. Honey or sweet concentrated fruit juices (e.g. of pears)
2. Raw sugar e.g. with cane sugar carefully processed.



3. Other (caffeinated) white sugar on the basis cane sugar or sugar beet sugar.
4. Enzymatic sweet compounds like Glucose syrups.

With the discussion about obesity the issue on sugar use gets more importance.

*Link to sensory properties:*

The use of the type or quantity of sugar or other sweet ingredients has a significant impact on sensory properties.

### **Use of oils and fats**

The EU rules for organic production do not limit the use of oils and fat.

*Differences found of potential relevance:*

Very few restrictions are found regarding the origin of fats. However for some oils processing methods are restricted with regard to max. temperature. See separate chapter Heat treatment.

Some companies, who follow a more “whole food/healthy nutrition” approach, have the following preferences:

- In first priority plant-based cold-pressed oils on the basis of olive, rapeseed, sunflower or other plant-based oils.
- use as little as possible palm oil or palm oil based fat products, although from environmental reasons (dependency from long-distance transportation).

There is an ongoing debate related to oils:

- Issues related to the content of different oils of secondary metabolites, interesting for health (Omega 3 fatty acids).
- Criticism of environmental organisation regarding palm oil production.

*Link to sensory properties:*

The type of oil and fat influences sensory properties (taste and texture).

### **Use of starch and starch based compounds**

The EU rules for organic production do not restrict the use of starch

*Differences found of potential relevance:*

The use of starch based compounds is restricted in some private standards like Bio Suisse (only native rice starch in yoghurts) and Demeter.

Due to risk of GMO contamination with some starch origins, some certifiers are very restrictive in allowing starch-based compounds, e.g. from corn.

*Link to sensory properties*

The type of starch used will influence sensory properties.

## **d. Use of ingredients of non-agricultural origin (without additives and processing aids)**

### **Use of salts**

The EU regulation (EC) 889/2008 does not differentiate the type of salts to be used.

*Differences found of potential relevance:*

Demeter only allows sea salt, rock salt or refined salt without the addition of iodine or fluorine. Nature & Progrès only allows sea salt without additives; they have an extra standards for marine

salts (10 pages!), with details on origin, conditions for production, storage, transport, contaminants and microbiological quality.<sup>29</sup>

Salt may contain anti-caking or free flowing agents. Bio Suisse, Bioland, Demeter and Naturland require that for other anti caking or free flowing agents than Calcium Carbonate (and for Bio Suisse and Bioland also Magnesium Carbonate) a written approval by the respective organisation is necessary. It has to be substantiated that it is impossible to use salt without anti caking in the specific production process.

Some companies exclude the use of anti-caking agents.

*Link to sensory properties:*

It is not clear how strong the impact of different salt types on sensory properties is.

### **Use of minerals and vitamins**

Based on EC Regulation 834/2007 minerals and vitamins can only be used if legally required.

*Differences found of potential relevance:*

Few differences were found in private standards.

Several companies, who follow a more “whole food/healthy nutrition” approach, do not supplement products; they only fulfil the legal requirement.

There are ongoing concerns of the organic sector regarding the legal supplementation obligation.

*Link to sensory properties:*

The use of supplements is relevant for sensory properties.

### **Use of yeast**

Since many years the private sector was asking for the possibility to produce in line with the principles of organic farming. Therefore the European Action plan for organic food and farming was requesting rules for yeast. Therefore in the Council regulation (EC) 834/2007 in Article 20 rules on the production of organic yeast has been laid down: For the production of organic yeast only organically produced substrates shall be used. Other products and substances may only be used in so far as they have been authorised for use in organic production in accordance with criteria for new inputs in Article 21.

Organic yeast shall not be present in organic food or feed together with non-organic yeast.

Detailed production rules have been laid down in Commission Regulation (EC) No 1254/2008 of 15 December 2008, amending Regulation (EC) No 889/2008.<sup>30</sup>

*Differences found of potential relevance:*

Requirements for organic yeast have been developed by few private labelling organisations since several years such as Bio Suisse and Demeter. Demeter and Naturland request that organic yeast, or if unavailable, yeast grown on organic substrates, have to be used. Only if such organic yeast neither is available may conventional yeast be used. Written confirmation that the yeast is not genetically modified is required. Naturland has even specific yeast standards.

*Link to sensory properties:*

If there are significant sensory differences between products produced with organic yeast and non-organic yeast is not known and would have to be verified.

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<sup>29</sup> <http://www.natureetprogres.org/servicepro/sp49.pdf>

<sup>30</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:337:0080:0082:EN:PDF>

### **c. Use of additives**

The EC Regulation 889/2008 has a detailed list of additives in Annex VIII, grouped in substances for plant and for meat products. For some additives specific conditions for use or type of products are given. Compared with the whole range of conventional additives, the list is limited.

The private standards and several companies have since many years tried to reduce further more these substances. Several justifications are given: Consumer expectations, health risks, precautionary principle, etc.

For some specific additives fact-sheets have been elaborated, e.g. on the website of [www.oekolandbau.de](http://www.oekolandbau.de)<sup>31</sup>; Soil Association<sup>32</sup>,

Below the main groups of additives are discussed following the logic of the E-numbering system. However some of the discussed additives have more than just one function. A detailed systematic is found in the Codex Alimentarius.<sup>33</sup> These functions have been considered when making the list of additives in the Guidelines for organically produced food.<sup>34</sup>

### **Colorants - additives**

The EU rules for organic production do allow some colorants mainly for some specialty cheeses. In additions colorants have been recently accepted in Commission Regulation (EC) No 1254/2008 of 15 December 2008, amending Regulation (EC) No 889/2008.<sup>35</sup>

For the traditional decorative colouring of the shell of boiled eggs produced with the intention to place them on the market at a given period of the year, the competent authority may authorise for the period referred to above, the use of natural colours and natural coating substances. The authorisation may comprise synthetic forms of iron oxides and iron hydroxides until 31 December 2013. Authorisations shall be notified to the Commission and the Member States."

#### *Differences found of potential relevance:*

Several private standards (Bioland, Demeter) do not allow the use of some of the colorants at all but allow the use of certified organic ingredients with colouring effects (like red beet root extract in strawberry yoghurt or for ice-cream). Bio Suisse does not allow any colouring ingredients or additives at all.

A few companies also do not use colorants.

#### *Link to sensory properties:*

The colour normally has a significant influence on consumer choice.

### **Additives for conservation such as sulfites and nitrates and nitrites**

The EU rules for organic production allow:

- The use of E220 Sulphur dioxide or the use of E 224 Potassium metabisulphite for fruit wines in fruit wines without added sugar (including cider and perry) or in mead (50 mg) for cider and perry prepared with addition of sugars or juice concentrate after fermentation (100 mg). The substances can be used in plant and animal products with the restriction of the EU general food regulatory rules;
- The use of E 250 Sodium nitrite or E252 Potassium nitrate in meat processing with the restrictions: indicative ingoing amount expressed as NaNO<sub>2</sub>: 80 mg/kg maximum residual amount expressed as NaNO<sub>2</sub>: 50 mg/kg.

<sup>31</sup> Fact sheets in German: <http://www.oekolandbau.de/verarbeiter/zutaten-und-zusatzstoffe/zusatzstoffe-und-technische-hilfsstoffe/>

<sup>32</sup> Short description of additives:

<http://92.52.112.178/web/sa/saweb.nsf/ed0930aa86103d8380256aa70054918d/62d2ffb33a96dc308025732b00415d76?OpenDocument>

<sup>33</sup> [http://en.wikipedia.org/wiki/List\\_of\\_food\\_additives,\\_Codex\\_Alimentarius](http://en.wikipedia.org/wiki/List_of_food_additives,_Codex_Alimentarius)

<sup>34</sup> [http://www.Codexalimentarius.net/download/standards/360/CXG\\_032e.pdf](http://www.Codexalimentarius.net/download/standards/360/CXG_032e.pdf)

<sup>35</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:337:0080:0082:EN:PDF>

*Differences found of potential relevance:*

Sulfites: Some private standards (Bio Suisse, Demeter, Nature & Progrès) do not allow their use for fruit and vegetable processing.

The use of nitrites/nitrates in meat products is excluded by Bio Suisse, Bioland and Demeter and Nature & Progrès. Furthermore on international level, after long and intensive discussions, nitrates/nitrites have not been taken up in the additive lists of Codex Alimentarius Guidelines, Demeter International and IFOAM Basic Standards.

*Link to sensory properties:*

There is a significant impact on sensory properties mainly regarding the colour of the raw-meat products.

**Antioxidants**

There are a few substances allowed as antioxidants in the EC Regulation 889/2008 for both plant as well as meat products:

- E 300 Ascorbic acids (use restricted to meat products)\*
- E 301 Sodium ascorbates but only in conjunction with the use of nitrites/nitrates in meat products.\*
- E 306 Tocopherol-rich extracts but only as antioxidant for oil and fat products and for meat products.

In meat products they stabilize the colouring process and are prevention against the formation of nitrosamines.<sup>36</sup>

*Differences found of potential relevance:*

The use of ascorbic acid is not allowed in AIAB, Bio Suisse and Demeter and Nature & Progrès. Bio Suisse recommends the use of Acerolla cherries, rich in natural ascorbic acid.

Bioland and Naturland allow for example ascorbic acids, but restrict it to few products (e.g. vegetable and fruit juices but not in meat products).

Nature & Progrès excludes the use of ascorbic acid of synthetic origin.

Furthermore on international level beside Demeter the Codex Alimentarius Guidelines and IFOAM Basic standards give preference to ascorbic acids of natural origin if available.

The use of Tocopherol-rich extracts in oil production is not allowed by AIAB, Bio Suisse, Bioland, Demeter, Naturland, and Nature & Progrès.

The use of ascorbic acid of synthetic origin (or even microbiological origin) is an ongoing debate.

*Link to sensory properties:*

The use of natural derived ascorbic acid might have an influence on sensory properties; however which can differ quite a lot between different product categories.

The influence of the non-use of tocopherol in oil production on sensory properties has to be verified. .

**Acidifiers, pH-regulators**

The EU rules for organic production allow several acids, ph-regulators and stabilisers with some restrictions:

*Differences found of potential relevance:*

Several private certifiers exclude the use of some acids:

- E 270 Lactic acid: Bio Suisse and Nature & Progrès allow it only as brine bath in cheese production.

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<sup>36</sup> More information on the German Website [www.oekolandbau.de](http://www.oekolandbau.de) : <http://www.oekolandbau.de/verarbeiter/zutaten-und-zusatzstoffe/zusatzstoffe-und-technische-hilfsstoffe/>

- E 330 Citric acid: Bioland, Nature & Progrès does not allow Citric acid at all. AIAB allows citric acid for Ricotta Cheese production. Bio Suisse does not allow it in fruit juices with the exception in syrups and in oil production but only for rape seed oil. Naturland allows it only for sunflower seed oil for further processing. Demeter allows it only for treatment of natural casings in meat production, for olives, for pasteurisation of vegetables preserved with lactic acid (when unavoidable). Naturland allows it for cheese and olive production but not for fruit and vegetable juices.
- E 322 Lecithine. In cereal products Demeter and Nature & Progrès does not allow the use of lectithine. AIAB, Bio Suisse, Bioland, Naturland allow its use only as organic ingredient (not modified).
- E 331 Sodium citrates and E333 Calcium citrates: Demeter does not allow its use. In meat products Nature & Progrès, Bioland, Naturland: as eXpedient for processing meat. Bio Suisse allows only microbiological origin.
- E334 Tartaric acid and 336 Potassium Tartrate: AIAB, Bioland, Naturland do no allow it. Bio Suisse, Nature & Progrès accept only microbial origin for cereal processing.
- Other acids, e.g. like E400 Alginic acid are not all allowed by many private standards (Bio Suisse, Bioland, Demeter, Naturland, Nature & Progrès

*Link to sensory properties:*

The type of acidifiers might have an impact on sensory properties.

### **Thickeners**

The EU rules for organic production allow several thickeners with some restrictions: if used in animal products allowed for milk products like E401 Sodium alginate and E 402 Potassium alginates, E 406 Agar-Agar and E 407 Carrageenan. Other products can be used without restrictions eXcept the ones set by general legislation such as E 410 Locust bean gum, E 412 Guar gum and E 414 Arabic gum and E 440a Pectin (not amidated) both for plant and animal products.

*Differences found of potential relevance:*

In milk products Bio Suisse does not allow at all plant based thickeners. Bioland, Demeter, Naturland: do not allow the use alginates. In cereal products AIAB, Bio Suisse, Nature & Progrès do not allow thickeners at all. Demeter only allows the use of E 406 Agar-Agar and E 440e Pectin. Bioland allow all additives of the EU list for organic production.

In fruit and vegetable products Bio Suisse and Demeter only allow E 440a Pectin but not the other thickeners. Bioland and Naturland do not further restrict the use of thickeners as in the EU organic rules.

In some private standard-setting organisations there is an on-going discussion to keep the use of thickeners limited.

*Link to sensory properties:*

The use of thickeners has significant influence on sensory properties.

### **Emulators**

The EU rules for organic production do generally not allow the large amount of conventional emulators (including phosphates). Therefore no detailed analysis is made.

### **Other additives**

There are a few additives listed in the EU Rules for organic production for different purposes. The most important ones are:

- E 500-504 Carbonate as backing powder.
- E 509 Calcium Chloride for milk coagulation.
- E 524 Sodium hydroXide for Pretzel type products.

- E 551 Silicium dioxide as anti-caking agent for herbs and spices

There are two groups of additives, which are excluded by the EU Regulation 889/2008:

- The use of flavour enhancers like glutamates is forbidden.
- Artificial sweeteners are not allowed to use in certified organic products.

*Differences found of potential relevance:*

E 504 Magnesium carbonate is forbidden by Nature & Progrès.

E 509 is not allowed by Bio Suisse.

E 551 Silicium dioxide is excluded by Nature & Progrès.

*Link to sensory properties:*

The impact on sensory properties will vary depending on the type of additives.

### **e. Use of processing aids and other substances of non-agricultural origin**

The EU rules for organic production list more than 30 processing aids, for use in plant and some in animal products. Often their specific conditions are indicated.

As these substances do not have per definition not have a strong impact on the product sensory properties, no detailed comparison of all relevant groups of processing aids is made.

The main focus in this comparison on additional other substances of non-agricultural origin are in this report on flavour, microorganisms and the use of enzymes.

#### ***Use of flavours:***

The EC regulation 889/2008 does allow the use of "natural flavours" in organic foods. The use of synthetically produced natural-identical flavours is forbidden.

However, the EU-legislation defines the term "natural" rather liberally, as BNN in its flavour recommendations 2007 describe.<sup>37</sup> The EU rules for organic production do not require "natural flavours" to originate from the named raw material. It is only necessary that the basic substance originates from nature in the broadest sense, which includes for instance tree bark (cellulose) or food industry waste materials. Furthermore to produce flavours, substances such as chemical solvents and extracting agents are used, and they are frequently still present in the final product. In addition, many of the special yeasts, fungi or bacteria essential for the production of many flavours, or their aids and additives, are today genetically manipulated.

*Differences found of potential relevance:*

The use of natural flavours is excluded in Bio Suisse and Demeter standards. However pure extracts from flavour-rich compounds (if from the named raw material in organic quality) can be made but is restricted to some product groups.

Several private organisations (Bioland, Naturland, Nature & Progrès) limit the use of natural flavours only to a few cases and to those from the named raw material. If available the raw material must be from organic production. Flavour-rich extracts or essential oils must be derived from certified organic raw material, however only with extraction processes using water or alcohol. The use of

The BNN-Association (2007) in Germany recommends to their members the following priority: Generally the highest priority is given to foods and products without any added flavours. If this is not feasible, then the following hierarchy (in combination with a transparent labelling for consumers) should be followed.

1. Organic flavour extracts and organic essential oils and if not available from conventional production.

<sup>37</sup> BNN 2007 (2007): The use of Flavours within the Organic Foodstuffs Trade. [http://www.bnn-monitoring.de/n-bnn.de/phpserve/input/downloads/Flavours\\_%20background\\_04\\_07.pdf](http://www.bnn-monitoring.de/n-bnn.de/phpserve/input/downloads/Flavours_%20background_04_07.pdf)

2. Organic flavours from the named raw material and if not available conventional flavours from the named raw material.

3. All remaining natural organic flavours and if not available conventional natural flavours.

Smoke flavours are acceptable and they should consist only of water and smoke. As far as other components (e.g., emulsifiers, carriers) are included these must comply with Appendix VIII of the EC Regulation 889/2008. For the extraction, wood from organic forestry, wood with the seal of approval of the Forest Stewardship Council (FSC) or untreated wood in its natural state should be given priority.

BNN has detailed requirements as other private standards regarding the use of so called natural flavours:

- Up to 95 percent of the flavours must originate from the named raw material.
- For flavours originating from plants, the remaining 5 percent must originate from sustainable plant material production.
- The named raw material should originate from organic farming, if possible.
- Raw materials of animal origin are not permitted in vegetable flavours.
- Only water or alcohol (or alcoholic compounds) are permitted as carrier solvents.
- Only appropriate foods (e.g. oil or alcohols), ethanol, water or carbon dioxide must be used for the extraction process.
- No genetically manipulated organisms (GVO) and no genetically manipulated raw materials may be used to produce the ingredients of a flavour.

Bioland has made comparable recommendations for their processors as BNN in a technical leaflet.

The use of flavours is an on-going strong issue of debate in the organic food sector. Several private companies reject the use of flavours to mimic raw materials or to remedy short-comings in quality. From the nutritional-physiological point of view the use of flavours is also disputed, since it is linked to the widespread problem of overweight. In addition, due to the generous flavouring of foods, children today often do not know the natural taste of the raw materials used.

*Link to sensory properties:*

The use of flavours or flavour rich extracts or essential oils influences strongly the sensory properties.

### ***Use of micro-organisms***

The EU Regulations and all standards exclude the use of GMO's or their derivatives.

*Differences found of potential relevance:*

Several standards require that micro-organisms are used which are grown on substrate, according to organic standards, if available (Bioland, Bio Suisse, Naturland, Demeter).

There is an ongoing debate how to further develop the availability of micro-organisms from suitable substrates.

*Link to sensory properties:*

The use of micro-organisms in general is very important on sensory properties, but little is known if the use of "organic" substrates might have an impact on sensory quality.

### ***Use of enzymes:***

The EC regulation 889/2008 does allow the use of enzymes in organic foods.

*Differences found of potential relevance:*

The use of enzymes in meat products is forbidden by AIAB, Bio Suisse, Bioland, Demeter, Naturland and Nature & Progrès.

In cereal products on the basis of Bio Suisse only amylase and hemi-cellulase is allowed.

Naturland: enzymes only on basis of grains, leguminous flower and honey. AIAB, Bioland, Demeter

and Nature & Progrès do not allow the use of enzymes in cereal products. In oils practically all analysed private standards do not allow the use of enzymes for oil.

For fruit and some vegetable processed products like juices the use of enzymes are allowed by Bio Suisse (only Pectinase), Bioland and Naturland (on permission), but not by AIAB and Nature & Progrès. Demeter restricts their use to certain products: Enzymes, also in dried form (pectolytic, proteolytic and amylolytic), not chemically preserved, and may be used for difficult pressings e.g. black currants, black berries, gooseberries. Bioland and Naturland allow the application only if pressing is difficult (e. g. berries, red grapes and the production of syrups, vegetable purees and celery juice); the enzymes have to be inactivated by re-heating afterwards.

Codex Alimentarius Guidelines and IFOAM Basic Standards do allow the use of enzymes as the EU rules for organic production do.

The use of enzymes is critically seen related to the use of GMO-products.

*Link to sensory properties:*

The use of enzymes can have an impact on sensory properties, depending from the product.

#### **f. Processing methods:**

In the EU Council Regulation (EC) 834/2007 it is emphasised in the foreword (whereas ...) point 19, that organic processed products should be produced by the use of processing methods which guarantee that the organic integrity and vital qualities of the product are maintained through all stages of the production chain.

Below are some examples where differences in the standards and the implementation of the EU Regulation were identified.

#### ***Minimum and careful processing methods and degree of processing***

According to the new EU Council regulation (EC) 834/2007 processing has to be “made with care” (Art. 6). Furthermore Article 16. 4 of that regulation states:

“Substances and techniques that reconstitute properties that are lost in the processing and storage of organic feed, that correct the results of negligence in the processing or that otherwise may be misleading as to the true nature of these products shall not be used.”

However there are no specific limitations with the exception of the exclusion of irradiation.

This might change, when rules for organic wine processing will be introduced, where the ORWINE EU project recommends the establishment of a negative list for some processing methods, which contradict with the principles of organic food processing<sup>38</sup>.

*Differences found of potential relevance:*

- The reconstitution of fruit juices with concentrates is excluded by several private standards (AIAB, Bio Suisse, Bioland, Demeter, Naturland, Nature & Progrès). They put the emphasis on so called “Direct” juice (sometimes also labelled in this way).
- Over-processing, e.g. double pasteurisation (e.g. of milk or of yoghurt) is excluded in a few standards (e.g. by Bio Suisse and Demeter)
- The use of fresh products instead of deep-frozen products is preferred in several standards and in some standards even explicitly required (e.g. Bio Suisse, Demeter).

Currently a debate is going on, in particular how to interpret the requirements of the EU rules that products have to be processed with care (see above). The private sector (IFOAM EU Group) is

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<sup>38</sup> See final recommendations for regulatory framework ORWINE Project website: [www.orwine.org](http://www.orwine.org)



discussing the development of a “Code of Practise” or even a common “Code of conduct” for food processing.<sup>39</sup>

- The non-application or strong limitation of homogenisation of milk as it is required Demeter (to a degree of less than 10% to be labelled as non-homogenised or to max. homogenisation degree of 30% according to the NIZZO method). In the yoghurt production homogenisation by means of a homogeniser is prohibited. Partial homogenisation by means of a centrifuge however is allowed in the production of yoghurt. Bio Suisse is limiting the homogenisation to max. 250 bar (recommended 200 bar). The restriction of homogenisation is seen as a more careful treatment of the milk, with the assumptions that this will ensure a more natural way of digesting milk proteins.<sup>40</sup>

*Link to sensory properties:*

The different treatments can have both an impact on the texture as well as on the appearance. (e.g. homogenised versus non-homogenised milk or direct juice versus juice from concentrates).

### **Heat-/pressure-treatment**

The EU rules for organic production have no special heat-/pressure treatments of food more what is already required by general food laws.

*Differences found of potential relevance:*

- Many private standards restrict the temperature for “cold” oil processing of eatable oils (AIAB, Bio Suisse, Bioland, Demeter, Naturland, Nature & Progrès).  
- Ultra-High temperature treatment of milk is excluded by only few standards (Demeter, Nature & Progrès). Bio Suisse and Bioland allow only a direct but not indirect technical treatment for UHT production is allowed. If direct and indirect ultra high temperature heating is combined, a  $\beta$ -Lacto globulin-value above 500 mg per litre milk shall be achieved. In Switzerland there was a strong debate some years ago, before UHT was finally allowed. In some private label organisations this discussion still goes on.

*Link to sensory properties:*

Several of the heat treatments have significant impact on sensory properties. The taste of milk is more intensive with no thermal treatment.

In the case of UHT treatments also clear sensory differences were found by the Swiss Milk Research Station Bern-Liebefeld between two different technical processes (direct with no off flavour or indirect with off flavour) but with different energy consumption (direct needs more energy!).<sup>41</sup>

### **Extraction methods**

Generally the extraction is mainly an issue in fruit and vegetable processing. The EU rules as well as the Codex Alimentarius Guidelines state that processing is made preferably with the use of biological, mechanical and physical methods but do not exclude chemical extraction (e.g. by hexane)

*Differences found of potential relevance:*

The extraction done with chemical extraction is excluded in a few private standards (AIAB, Bio Suisse, Bioland, Demeter, Naturland, Nature & Progrès).

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<sup>39</sup> In the EU funded project a code of practise have been developed in the Subproject processing. Beck, Alexander (2006): Code of Practice for Organic Food Processing. QLIF/FiBL Report. Research Institute of Organic Agriculture (FiBL), Frick, Switzerland. <http://orgprints.org/7031/>

<sup>40</sup> Justification of non-homogenisation (in German): <http://www.forschungsring.de/index.php?id=114>

<sup>41</sup> [http://www.db-alp.admin.ch/de/publikationen/docs/vortrag\\_2005\\_03\\_30\\_24.pdf?PHPSESSID=2252e5bd7a263e9bb318e139ad4d40f2](http://www.db-alp.admin.ch/de/publikationen/docs/vortrag_2005_03_30_24.pdf?PHPSESSID=2252e5bd7a263e9bb318e139ad4d40f2)

IFOAM Basic standards also explicitly limit the extraction methods to the use of: water, ethanol, plant and animal oils, vinegar, carbon dioxide, and nitrogen. These substances shall be of a quality appropriate for their purpose.

The extraction techniques are currently in 2009 not a special issue of debate.

*Link to sensory properties:*

Not enough is known on the different impact of chemical extraction and physical extraction methods on sensory properties.

### **Smoking methods**

The EU rules do not specify the rules for smoking (e.g. for meat products).

*Differences found of potential relevance:*

Several standards mention that smoking has to be done with untreated wood and exclude the use of artificial smoke flavours (see later). Demeter requires the use of the “Cold smoke method” for sausages to be eaten raw. For other sausages types but also for some cheese types warm smoking processes (< 70°C) are permitted.

Black smoking technique is not allowed by Naturland for meat.

*Link to sensory properties:*

It can be assumed that there sensory properties are affected differently by different smoking techniques

### **Use of microwaves:**

The EU rules for organic production do allow the use of microwaves.

*Differences found of potential relevance:*

The use of microwaves technique excluded in the following standards: Bio Suisse, Demeter International, Bioland, Naturland. Also IFOAM Basic Standards does exclude this technique.

*Link to sensory properties:*

Microwaves are mostly used for food security measures (e.g. for herb treatment). No significant impact is expected related to sensory properties.

### **Filtration**

The EU rules for organic production do not specify the type of filters

*Differences found of potential relevance:*

Some private standards specify the use of filters: asbestos-free filters are required in several private national and international standards (Bio Suisse, Naturland).

There is currently in 2009 a discussion about the exclusion of nanofilters and ultrafiltration for wine, due to negative feedback of many organic European wine producers.<sup>42</sup>

*Link to sensory properties:*

Not enough is known of the impact on different filter materials on sensory properties.

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<sup>42</sup> See final report with recommendations for the regulatory framework for wine. [www.orwine.ch](http://www.orwine.ch)

## **f. Packaging**

Most of the standards state some basic principles, e.g. like the Naturland standards (2008): “The packaging has to be restricted to fulfil hygienic requirement and to preserve the condition and sensory quality of the products. The use of packaging used must not impair the product quality (e.g. through substances migration). Ecological requirements should be given preference. “ However these standards make just a positive list of packaging materials for each product group, without excluding specific generally used materials.

### *Link to sensory properties:*

Packing should in generally not have a significant impact on sensory properties but much more on shelf life. However this might vary very much depending on packaging material and product (e.g. maturation of cheese in plastic will change sensory properties).

## **g. Storage, bottling, bagging and transport**

The EU rules for organic production do not have specific rules for storage, bottling and transport related to sensory quality.

### *Differences found of potential relevance:*

Most of the standards, e.g. like Naturland, state some general principles, that “all products must be stored and transported in a way that minimises possible reduction of their quality and the impairment to the environment.”

The issue of transport is mostly discussed in the conteXt of environmental concerns (Reducing “food miles”) but not related primarily to sensory properties.

### *Link to sensory properties:*

Long storage and transportation has leads often to the use of more additives and can also influence sensory properties.

## **h. Slaughter**

The EU rules for organic production do not have specific rules for slaughter.

### *Differences found of potential relevance:*

Several standards have additional more detailed requirements, which however have the main focus on the animal welfare and not on sensory properties.

In addition some standards have requirements, which can also influence the quality and sensory properties of the meat, like Naturland, which requires that beef carcasses sold in a shop has to be at least 10 days time to ripen at deep temperatures.

There is an ongoing debate on how to improve slaughtering of organic animals.

### *Link to sensory properties:*

Most of the requirements do not have a direct impact. However the slaughtering conditions can have a significant impact on sensory properties.

## **i. Cleaning and hygiene**

No comparison was made, as this was not considered as being considerably different between the different regulations and standards. Basically EU regulation 889/2008, Annex VII contains a list of allowed substances

## **k. Labelling**

The analysis has not looked at the different labelling requirements, which are in place in private standards, additionally to the general requirements of the EU regulations for organic food and farming, as these do not directly have an impact on sensory properties. However they are important to make consumers aware about the naturalness of a product and help them to give them a clearer choice.

## 4 Potential impact of standards requirements on taste of selected product groups

I

### 4.1 Analysis of potential impact and their limits

In particular in strongly processed multi-ingredient products it is often difficult to link specific requirements to specific sensory properties. The analysis is summarized in tables.

A preliminary identification of impact factors on sensory properties is made based on literature and expert knowledge. Without indicating as these changes are perceived as positive or negative. Furthermore the specific additional requirements of private standards were assessed if they contribute to a better quality differentiation and if they contribute to higher freshness/authenticity.

As in Chapter 3 detailed information is given, what substances and processes are generally allowed by the EU Regulations for organic production, we do not repeat this information for each product group.

### 4.2 Milk products

Among the chosen milk products were yoghurts and soft cheese.

#### 4.2.1 Yoghurts

For yoghurts, as outlined in Tab. 4.1 the following most important differences between the EU rules for organic production and private standards have been identified as being relevant for sensory properties:

Ingredients of agricultural origin:

- Generally little differences have been found. Few standards restrict the use of starch based compounds (used as thickener)
- One private standard (Bio Suisse) does exclude the **use of colouring ingredients** at all, where most of the private standards as the EU rules do allow it.
- **Extracts from flavour rich compounds** are excluded by one standard, the other standards and the EU allows it.

Ingredients of non-agricultural origin: no relevant differences

Additives:

- Few standards do not allow do not allow the **use of alginates** as thickener in milk products.
- Two standards do not allow the use of **plant based thickeners** in yoghurt.

Processing aids and other substances:

- Several standards require the **use of flavours** only from name-giving substance (possibly organic).
- **Use of natural flavours** is not allowed by two standards.

Processing methods:

- Two standards restrict the **homogenisation of milk** for yoghurt, one standard does exclude it.

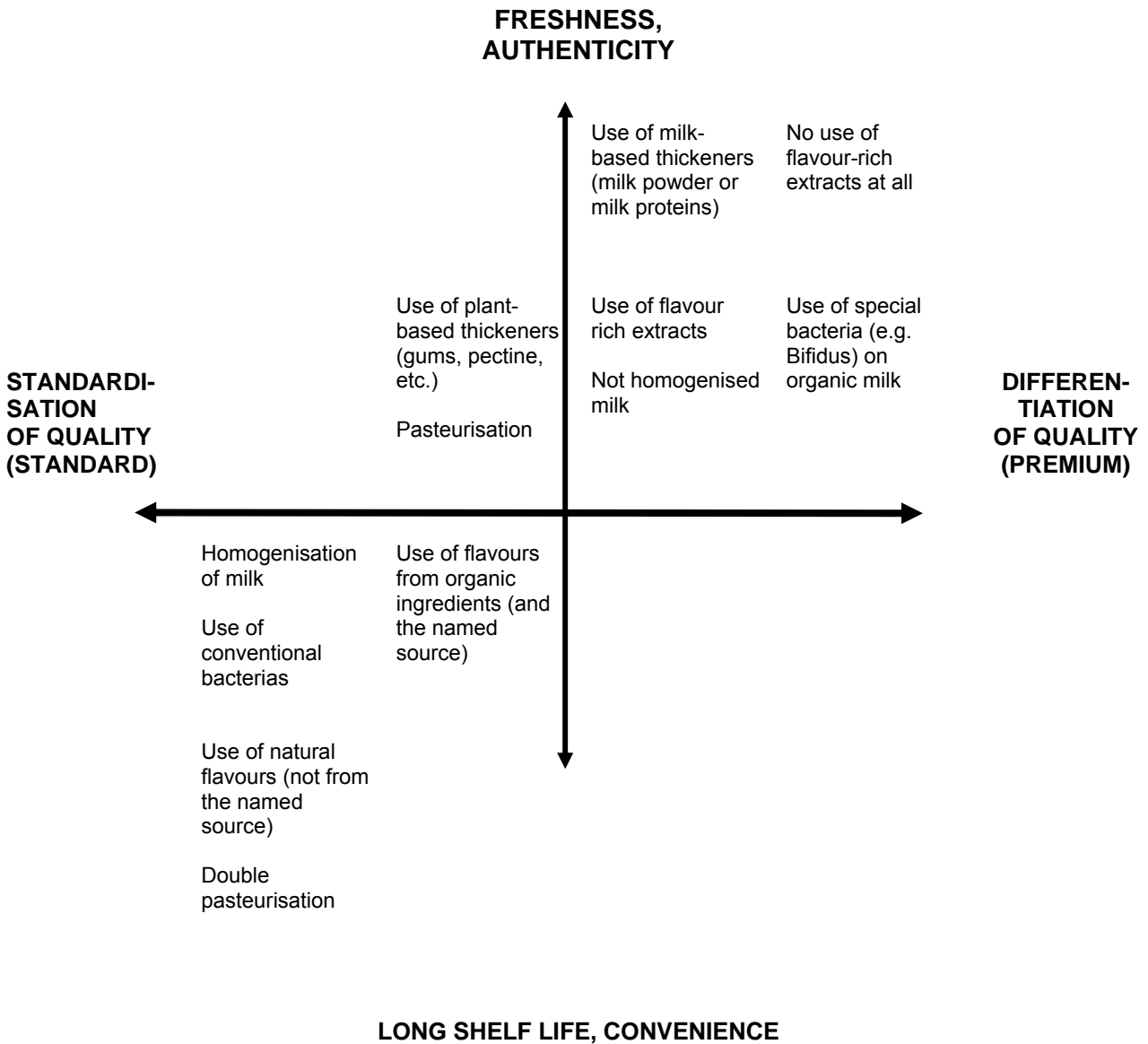
More details can be found in Annex I of this document.

**Table 4.1 Comparison of sensory-relevant regulations and standards requirements for yoghurts**

Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements agric. production</b>	Feeding of animals, pasture (required)	<i>Nature &amp; Progrès</i> : no silage	X	-	-
<b>Ingredients of agricultural origin</b>	Starch based compounds	<i>Bio Suisse</i> : Only native rice based starch <i>Demeter</i> : only for puddings	X X	- -	X (X)
	Colouring ingredients (red beet, or grape juice concentrate)	<i>Bio Suisse</i> : Not allowed <i>Bioland, Naturland</i> : A	X X	X	X
	Extracts from flavour rich compounds	<i>Bio Suisse</i> : Not allowed <i>Bioland, Demeter, Naturland</i> : A	X X	X	X
<b>Ingredients of non-agricultural origin</b>	Salt forms (no specification) (seldom used in yoghurts)	<i>Nature &amp; Progrès</i> : only sea salt	(X)	X	X
<b>Additives</b>	E 270 Lactic acid for the brine bath in cheese production	<i>Nature &amp; Progrès, Bio Suisse</i> : Not allowed	-	-	-
	Non-milk based thickeners: E 400-E402 Alginates, E 406 Agar agar, E 407 Carrageenan, E410 Locust bean gum E 412 Guar Gum	<i>Nature &amp; Progrès, Bio Suisse</i> : Not allowed at all <i>Bioland, Demeter, Naturland</i> : no Alginates	X	X	X
	E440i Pectin for fruit based ingredients	<i>Bio Suisse, Bioland, Demeter, Naturland, Nature &amp; Progrès, Codex</i> : non-amidated	X	X	X
<b>Processing aids and other substances</b>	Starter cultures (yoghurt bacteria, etc.)	-	X	X	X
	Natural flavours	<i>Bio Suisse, Demeter</i> Not allowed <i>Bioland, Naturland, Nature &amp; Progrès, BNN</i> :: Natural flavouring agents from vegetable (name-giving) food if possible organic	X	X	X
<b>Processing methods</b>	Pasteurisation	<i>Bio Suisse</i> : non-peroxydase positive	X	X	X
	Homogenisation of milk	<i>Nature &amp; Progrès</i> : not allowed <i>Bio Suisse</i> : max. 250 bar <i>Demeter</i> : only with centrifuge	X	X	X
	Second heat treatment after fermentation	<i>Nature &amp; Progrès, Bio Suisse</i> : not allowed	(X)	(X)	(X)

X relevant impact      - no impact

The different processing approaches for organic yoghurt are visualised in the Figure 4.1 below



**Figure 4.1: Typology of differently processed organic yoghurts linked to differentiation/standardisation as well as to freshness/long shelf life**

## 4.2.2 Soft cheese

Like with yoghurt there were some specific relevant requirements found mostly in a few private standards.

In Tab. 4.2 the following the most important differences between the EU rules for organic production and private standards are summarised as being relevant for sensory properties:

Ingredients of agricultural origin:

- **Extracts from flavour rich compounds** are not allowed in one standard whereas most of the private standards allow its use.

Ingredients of non-agricultural origin: no relevant differences (eXcept for salt).

Additives:

- Several standards do not allow **colouring additives** for special cheese.

Processing aids and other substances:

- Two standards do not allow **natural flavour extracts**, whereas others do allow it.
- **Cheese cultures** have an important influence on sensory properties

Processing methods:

- Little differences between the processing methods were found.

More details can be found in Annex I of this document.

**Table 4.2 Comparison of sensory-relevant regulations and standards requirements for soft cheese**

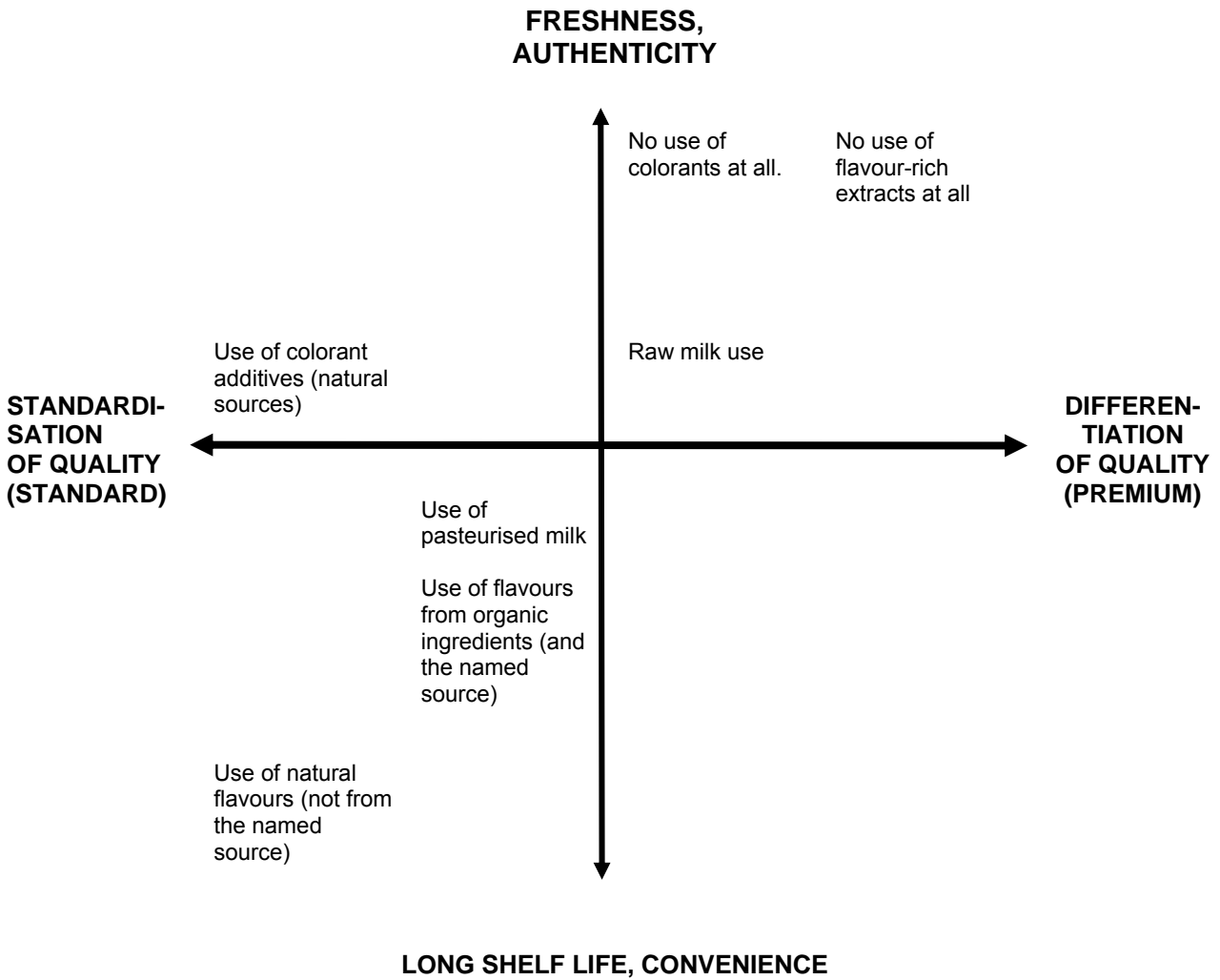
Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements</b>	Feeding of animals, pasture (required)	<i>Nature &amp; Progrès</i> : no silage	X	X	X
<b>Ingredients of agricultural origin</b>	Plant-based ingredients (e.g. herbs)	<i>AIAB</i> : Organic vegetable oils for shapes defining	X	(X)	X
	Extracts from flavour rich compounds	<i>Bio Suisse</i> : Not allowed <i>Bioland, Demeter, Naturland</i> : A	X	X	X
<b>Ingredients of non-agricultural origin</b>	Salt forms (not specified)	<i>AIAB</i> : for ricotta Epsom salts (Epsomite) is allowed <i>Nature &amp; Progrès</i> : only sea salt	(X)	X	X
<b>Additives</b>	For special cheeses : Colorants: E 153 vegetable carbon, E 160b Annatto, Bixin, Norbixin	<i>Bio Suisse, Demeter</i> : not allowed <i>Nature &amp; Progrès</i> : A	X X	X	X



<b>Relevant standards issues for sensory properties</b>	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	<i>Private organic standards If more restrictive than EU</i>	Sensory impact	Freshness / Authenticity	Differentiation of quality
	E 170 Calcium Carbonate	<i>Bio Suisse</i> : only in salt <i>Bioland, Demeter, Naturland</i> : only for sour milk cheese	-	-	-
	E 509 Calcium chloride	<i>Bio Suisse</i> : Restricted for pasteurized milk <i>Bioland</i> : Not allowed <i>Demeter, Naturland Nature &amp; Progrès</i> : A	(X)  (X) X	-	-
<b>Processing aids and others substances</b>	pH-regulators in brine (salt) baths: Lactic acid, citric acid, (hydrochloric acid)	<i>Bio Suisse</i> : Only lactic acid for brine bath	-	-	-
	Cheese cultures (starter bacteria's, cultures for surface treatment etc.)		X	X	
	Rennet (with no preservatives)		-	-	-
	Natural flavour extracts	<i>Bio Suisse, Demeter</i> : Not allowed	X	X	X
	Surface treatments with plastic PVA (Polyvinyl acetate) dispersions for cutting and semi-hard cheese.	<i>Bio Suisse</i> : not allowed  <i>Bioland, Demeter, Naturland</i> : allowed	X  X	X	X
<b>Processing methods</b>	Pasteurisation	Some companies: raw milk use	X		
	Thermisation		(X)		
	Bactofugation		X	X	
	UHT Treatment or sterilisation	<i>Bio Suisse, Demeter, Naturland</i> : not allowed	X		
	Change of content trough ultrafiltration	<i>Bio Suisse, Naturland</i> : Ultrafiltration excluded	?	-	-
	Smoke	<i>Bio Suisse, Demeter, Naturland</i> : from untreated wood	X	-	-
<b>Storage</b>	Storage in plastic films during maturation		X		
<b>Packaging</b>	Not specified	<i>AIAB, Bioland, Demeter, Naturland</i> : positive list	-	X	X

X relevant impact      - no impact

The different processing approaches for organic soft cheese are visualised in Figure 4.2



**Figure 4.2: Typology of differently processed organic soft cheese linked to differentiation/standardisation as well as to freshness/long shelf life**

## 4.3 Meat products

In the project the main focus is on Salami.

### 4.3.1 Salami

Some specific relevant requirements were found mostly in a few private standards as summarised in Tab. 4.3

Ingredients of agricultural origin:

- **Extracts from flavour rich compounds** are not allowed in one standard whereas most of the private standards allow its use.

Ingredients of non-agricultural origin: no relevant differences (except for salt).

Additives:

- The most significant difference is between standard allowing or not allowing the **use of nitrites and nitrates** in meat products and consequently also not Ascorbates.
- Few standards exclude the **use of ascorbic acid**. Instead Acerolla Cherry extract is recommended.

Processing aids and other substances:

- Few standards exclude the **use of natural flavours**.
- **Gelatine** is allowed but without additives, except one standard, which does not allow it.
- Several standard do not allow to use **enzymes** in meat processing

Processing methods:

- Several standards require that the meet is not tendered.

More details can be found in Annex I of this document.

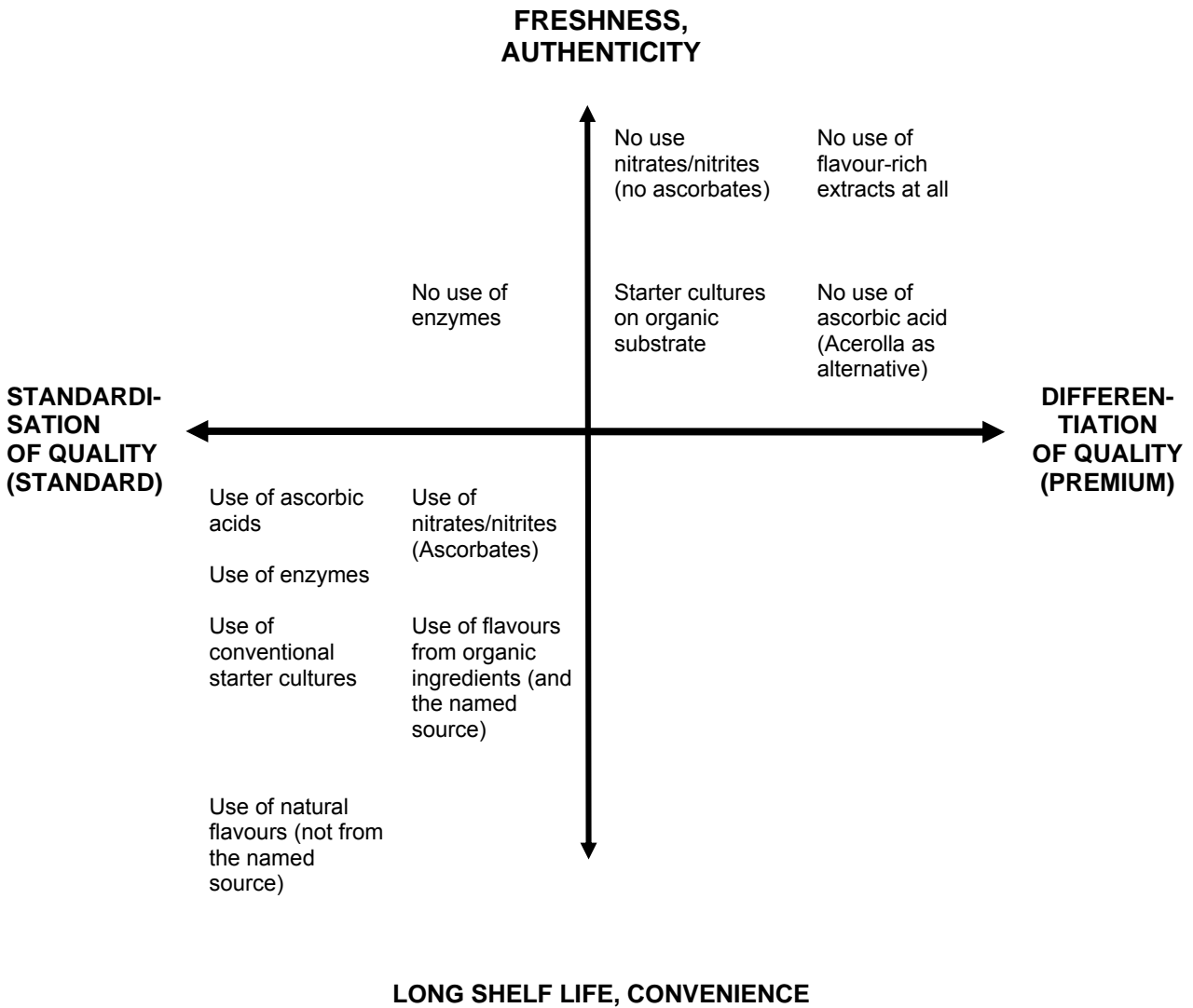
**Table 4.3 Comparison of sensory-relevant regulations and standards requirements for salami**

Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements</b>	Feeding requirements		X		
	Slaughter: longer ripening time	<i>Naturland:</i> Minimum 10 days ripening for fresh meat	X		X
<b>Ingredients of agricultural origin</b>	Milk products	<i>Nature &amp; Progrès:</i> no lacto-protein.	X	X	X
	Extracts of flavour rich compounds (e.g. spice extracts)	<i>Bio Suisse. Only extract of rosmarin (anti-oxidative)</i> <i>Demeter:</i> Not allowed	X	X	X
	Hydrolysed proteins	<i>Nature &amp; Progrès:</i> not allowed.	(X)	X	X
<b>Ingredients of non-agricultural origin</b>	Salt forms (not specified)	<i>Nature &amp; Progrès:</i> only sea salt	(X)	X	X

<b>Relevant standards issues for sensory properties</b>	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	<i>Private organic standards If more restrictive than EU</i>	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>Additives</b>	E 250 Sodium nitrite (curing salt) indicative ingoing amount expressed as NaNO <sub>2</sub> : 80 mg/kg maximum residual amount expressed as NaNO <sub>2</sub> : 50 mg/kg	<i>Bioland, Demeter, Nature &amp; Progrès</i> : not allowed. <i>Naturland</i> : 80 mg/kg is mandatory and not only indicative	X	X	X
	E 252 Potassium nitrate (curing salt) indicative ingoing amount expressed as NaNO <sub>2</sub> : 80 mg/kg. Maximum residual amount expressed as NaNO <sub>2</sub> : 50 mg/kg	<i>Bioland, Demeter, Naturland, Nature &amp; Progrès</i> : Not allowed	X	X	X
	E 270 Lactic acid	<i>Bio Suisse, Bioland, Demeter; Naturland</i> : for treating natural skins	-	-	-
	Preservatives such as E 300 Ascorbic acid and Sodium Ascorbates.	<i>Bio Suisse, Demeter, Nature &amp; Progrès</i> : Not allowed; <i>Naturland</i> : A with E 250	X	X	X
	E 331 Sodium citrate	<i>Bio Suisse</i> : only micro-biological origin <i>Bioland, Demeter, Naturland</i> : As expedient for processing meat	X	-	-
	E325 Sodium lactate	<i>Bio Suisse</i> : Not allowed <i>Bioland</i> : for treating natural skins	-	-	-
<b>Processing aids and others substances</b>	Natural flavours	<i>Bio Suisse and Demeter</i> : not allowed	X		
	Gelatine	<i>Bio Suisse, Bioland, Naturland</i> : Gelatine without additives <i>Nature &amp; Progrès</i> : not allowed	X	-	-
	Starter cultures (bacteria)	<i>Bioland, Naturland</i> : grown on organic substrate, when available	X	X	X
	Enzymes	<i>Bio Suisse, Bioland, Naturland Nature &amp; Progrès</i> : not allowed	(X)	-	-
<b>Processing methods</b>	Physical treatments (Cutting, heating etc.)	<i>Naturland</i> : use of "mechanically recovered meat (MRM) <i>Demeter</i> : no tendering treatments	X	X	
	Cooking,	<i>Nature et Progrès</i> : Temperature restrictions (69-73 °C)	X	X	X
<b>Storage</b>	none		X		
<b>Packaging</b>	Natural and artificial skins	<i>Bio Suisse, Bioland, Demeter Naturland</i> : both allowed	X	X	X

	Films or plastic	<i>Bioland, Naturland:</i> limited list.	X	-	-
X relevant impact	- no impact				

The different processing approaches for organic salami are visualised in Figure 4.3



**Figure 4.3 Typology of differently processed organic salamis linked to differentiation/standardisation as well as to freshness/long shelf life**

## 4.4 Cereal based products

In the project the main focus was on bakery products (mainly cookies).

### 4.4.1 Bakery products

Some specific relevant requirements were found mostly in a few private standards.

In Tab. 4.4 the following the most important differences between the EU rules for organic production and private standards are summarised as being relevant for sensory properties:

Ingredients of agricultural origin:

- **Extracts from flavour rich compounds** are not allowed in one standard whereas most of the private standards allow its use.
- **Acerolla cherry extract** (rich in ascorbic acid) instead of Ascorbic acid in two standards.

Ingredients of non-agricultural origin: no relevant differences:

- Several standards require the use of certified **organic yeast**.

Additives:

- Several standards exclude the **use of ascorbic acid**.
- **Lecithin** is not allowed by one standard.
- Several standards exclude the **use of acids** such as citric acid, tartaric acid, Alginic acids (instead the extract from citrons is used).
- Several standards exclude the **use of thickeners** totally or partially such as different gums, etc.

Processing aids and other substances:

- Several standards exclude the use of **natural flavours**. Other request only natural flavours from the name giving substance.

Processing methods:

- Many standards exclude the use of **microwaves**.
- Generally only few restrictions on processing methods were found.

More details can be found in Annex I of this document.

**Table 4.4 Comparison of sensory-relevant regulations and standards requirements for bakery products**

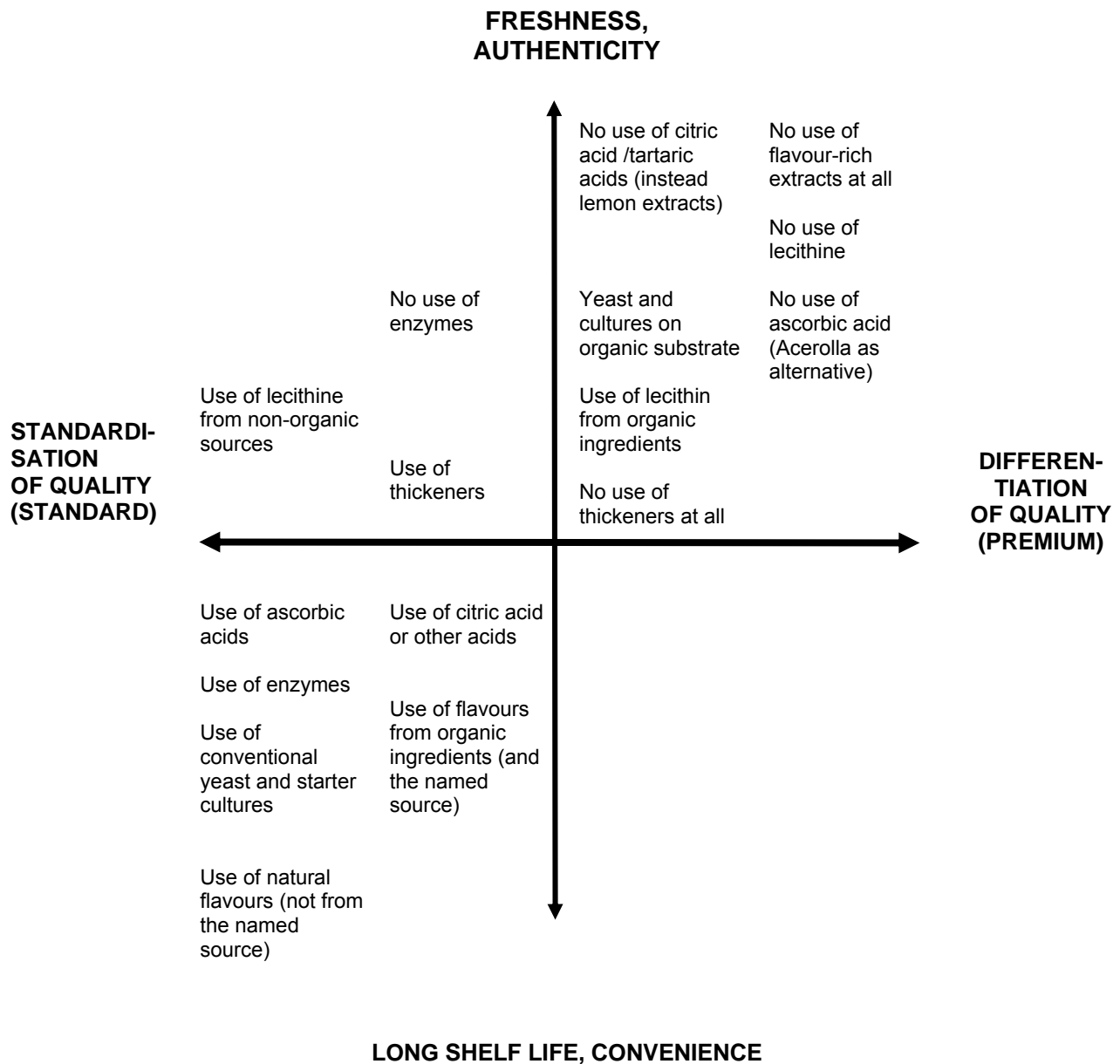
Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements</b>	Choice of special varieties	none	X	X	X
<b>Ingredients of agricultural origin</b>	Sugar and honey (organic)		X	(X)	(X)
	Acerolla cherry extract (rich in ascorbic acid)	<i>Bio Suisse, Demeter:</i> instead of Ascorbic acid	X	X	X
	Flavour rich extracts	<i>Bio Suisse,</i> Not allowed except Rosemarie extract (antioxidative) <i>AIAB:</i> allowed if labelled <i>Bioland, Demeter</i> <i>Naturland:</i> allowed	X	X	X
<b>Ingredients of non-agricultural origin</b>	Yeast and yeast replacements	<i>Bio Suisse, Bioland, Nature &amp; Progrès:</i> organic if available <i>AIAB, Naturland:</i> Non-organic allowed	X	X	X
	Salt forms Not specified	<i>Nature &amp; Progrès:</i> only sea salt	(X)	X	X
<b>Additives</b>	Preservatives such as E 300 Ascorbic acid, etc.	<i>AIAB, Bio Suisse, Bioland, Naturland, Nature &amp; Progrès:</i> Not allowed	X	X	X
	E322 Lecithin	<i>Nature &amp; Progrès:</i> not allowed <i>AIAB, Bio Suisse, Bioland:</i> only as organic ingredient <i>Naturland:</i> A, native, not modified	X	(X)	X
	E 330 Citric acid	<i>AIAB, Bioland, Naturland, Nature &amp; Progrès:</i> not allowed (instead e.g. lemon extracts) <i>Bio Suisse:</i> only microbial origin	X	X	(X)
	E334 Tartaric acid	<i>AIAB, Bioland, Naturland:</i> not allowed <i>Bio Suisse, Nature &amp; Progrès:</i> only microbial origin	-	(X)	(X)
	E 335 Sodium tartrate and E 336 Potassium Tartrate	<i>AIAB:</i> only E 336 <i>Bioland, Naturland, Nature &amp; Progrès:</i> A <i>Bio Suisse:</i> only microbial origin	-	(X)	(X)
	Other acids, e.g. like E400 Alginate acid	<i>AIAB, Bio Suisse, Naturland, Nature &amp; Progrès:</i> no other acids.	X	X	(X)

Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
	Plant-based thickeners: E 406 Agar agar, E410 Locust beam gum, E412 Guar gum, E 440 Pectin	<i>AIAB</i> : only as ingredients <i>Bio Suisse, Nature &amp; Progrès</i> : not allowed <i>Bioland, Naturland</i> : all allowed <i>Demeter</i> : only E406 and E440a	X	X	X
	E 500-*504 Baking powders (carbonate-based)	<i>AIAB, Bio Suisse, Bioland, Naturland</i> : Allowed	(X)	-	-
	E 524 Sodium hydroxide	<i>AIAB</i> : not allowed <i>Bio Suisse, Bioland, Naturland</i> : allowed for Bretzel type products	X	-	X
<b>Processing aids and others substances</b>	Enzymes	<i>Bio Suisse</i> , only amylase and hemicellulase <i>AIAB, Bioland</i> : no enzymes <i>Naturland</i> : Only on basis of grains, leguminous flower and honey	(X)	X	X
	Natural flavours	<i>Bio Suisse, Bioland Naturland</i> : Not allowed <i>AIAB</i> : allowed but obtained through physical extraction	X	X	X
	Cultures (sour dough, other starters, etc.)		X	X	X
	Separating substances: e.g. flower, starch, etc. (certified origin); wax (bees or carnauba wax)	<i>Bio Suisse</i> : Allowed <i>Bioland Naturland</i> : Only allowed as organic	-	-	-
<b>Processing methods</b>	Bakery process (heating)		X	X	X
	Deep freezing of compounds before processing	<i>Nature &amp; Progrès</i> : not allowed.	X	X	X
	Extrusion		X		
	Microwaves	<i>Bio Suisse, Bioland, Demeter Naturland</i> : Not allowed	-	X	X
<b>Storage</b>	Not specified				
<b>Packaging</b>	Not specified				

X relevant impact      - no impact



The different processing approaches for organic bakery products are visualised in Figure 4.4



**Figure 4.4 Typology of differently processed organic bakery products linked to differentiation/standardisation as well as to freshness/long shelf life**

## 4.5 Oil products

### 4.5.1 Plant-based oils for direct consumption

Some specific relevant requirements were found mostly in a few private standards.

In Tab. 4.5 the most important differences between the EU rules for organic production and private standards are reported as being relevant for sensory properties:

Ingredients of agricultural origin:

- Generally

Ingredients of non-agricultural origin: no relevant differences

Additives:

- Several standards exclude the use of **citric acid and tocopherol extract**.

Processing aids and other substances:

- Several standards do exclude the **use of natural flavours** as well as the **use of enzymes**,

Processing methods:

- Several standards limit the **maximum temperature for cold pressing**

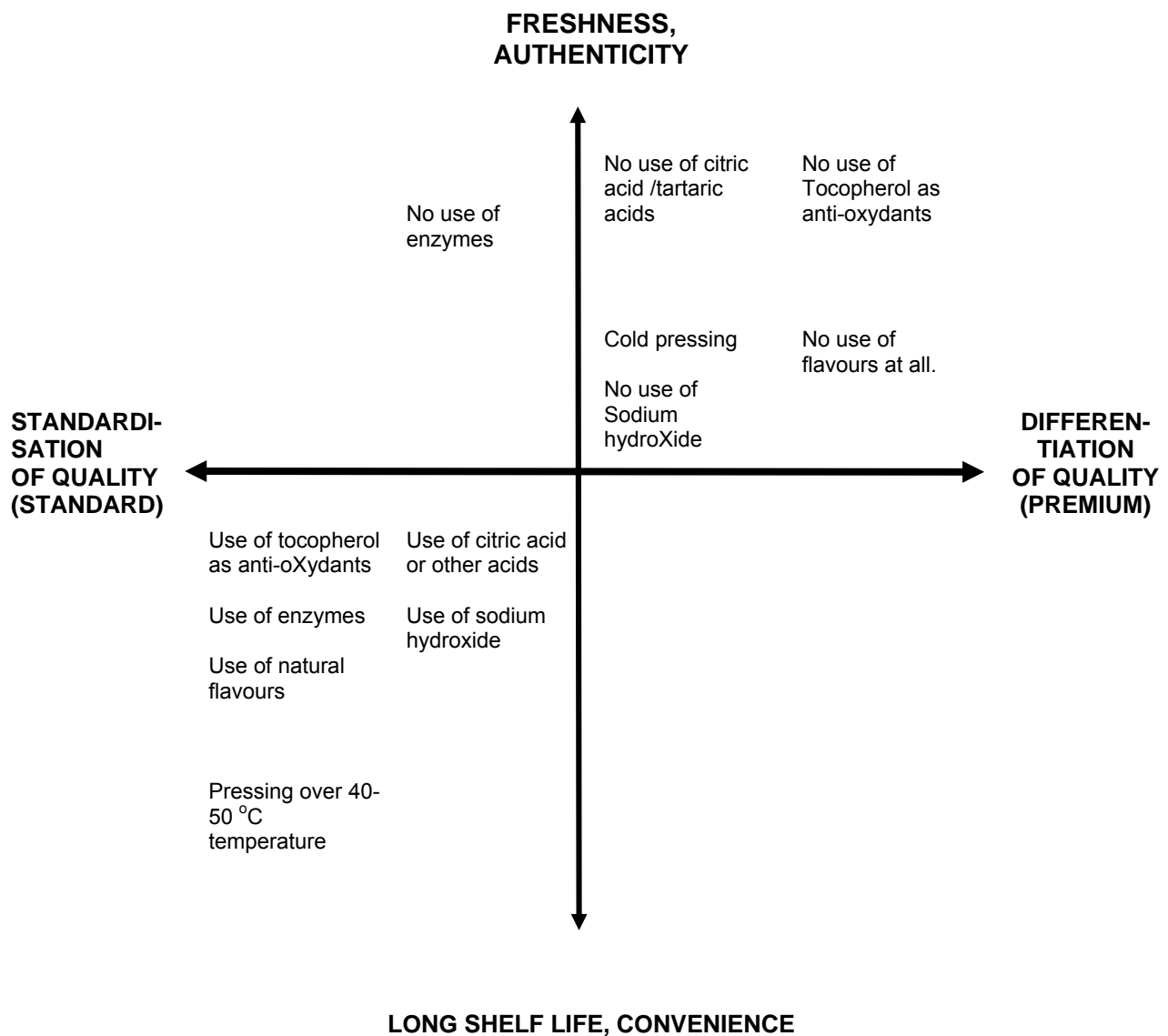
More details can be found in Annex I of this document.

**Table 4.5 Comparison of sensory-relevant regulations and standards requirements for plant-based oils for direct consumption**

Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements</b>	Non specified				
<b>Ingredients of agricultural origin</b>	Different plant-based ingredients (e.g. herbs)		X	X	-
<b>Ingredients of non-agricultural origin</b>	Salt forms	<i>Nature &amp; Progrès</i> : only sea salt	(X)	X	X
<b>Additives</b>	E 330 Citric acid	<i>Bio Suisse</i> : only for rape seed oils (for baking) <i>Naturland</i> : only for sunflower seed oil for further processing. <i>Bioland, Nature &amp; Progrès</i> : No	X	(X)	X
	E 306 Tocopherol-rich extract - Use as anti-oxidant	<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès</i> : not allowed	X	X	X
	E 524 Sodium hydroxide - only for rape seed oils	<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès</i> : not allowed	X	-	X
<b>Processing aids and others substances</b>	Charcoal	<i>Nature &amp; Progrès</i> : not allowed <i>Bio Suisse, Naturland</i> : only for further processed oil	X	-	X
	Natural flavours	<i>Bio Suisse, Naturland</i> : not allowed	X	X	X
	Ethyl-alcohol	<i>Naturland</i> : only to extract, when low oil content	-	-	-
	Enzymes	<i>AIAB; Bio Suisse, Bioland; Demeter, Naturland</i> : not allowed	-	X	X
<b>Processing methods</b>	Physical treatments (cleaning, heating centrifugation, decantation etc.	<i>AIAB</i> : max. 37 °C <i>Bio Suisse</i> : Cold pressing up to max. 50 °C for processing max. 100 °C <i>Bioland, Demeter, Naturland</i> : max. 40 °C for olive oil and max. 60 °C for sunflower oil <i>Nature &amp; Progrès</i> : max. 40 °C	X	X	
<b>Storage</b>	None				
<b>Packaging</b>	none		X	X	X

X relevant impact      - no impact

The different processing approaches for organic oils are visualised in Figure 4.5



**Figure 4.5 Typology of differently processed organic oils linked to differentiation/standardisation as well as to freshness/long shelf life**

## 4.6 Vegetable products

The main focus was on tomato products/sauce.

### 4.6.1 Tomato products/sauce

Some specific relevant requirements were found mostly in a few private standards.

In Tab. 4.6 the most important differences between the EU rules for organic production and private standards are summarised as being relevant for sensory properties:

Ingredients of agricultural origin:

- Generally there are little differences related to the use of ingredients of agricultural origin.

Ingredients of non-agricultural origin: no relevant differences

Additives:

- Several private standards exclude the **use of lactic acid, citric acid and ascorbic acid** but other standards restrict their use to a few products.
- Two standards exclude the use of the group of **thickeners**; where as other standards do allow it.

Processing aids and other substances:

- Two standards exclude the use of **natural flavours**, whereas other standards require that they are produced from the name-giving substance.
- **Enzymes** are allowed by a majority of standards.
- **Ion exchange resins** are not allowed by a majority of private standards.

Processing methods:

- Several standards exclude the **reconstitution from concentrates**.

More details can be found in Annex I of this document.

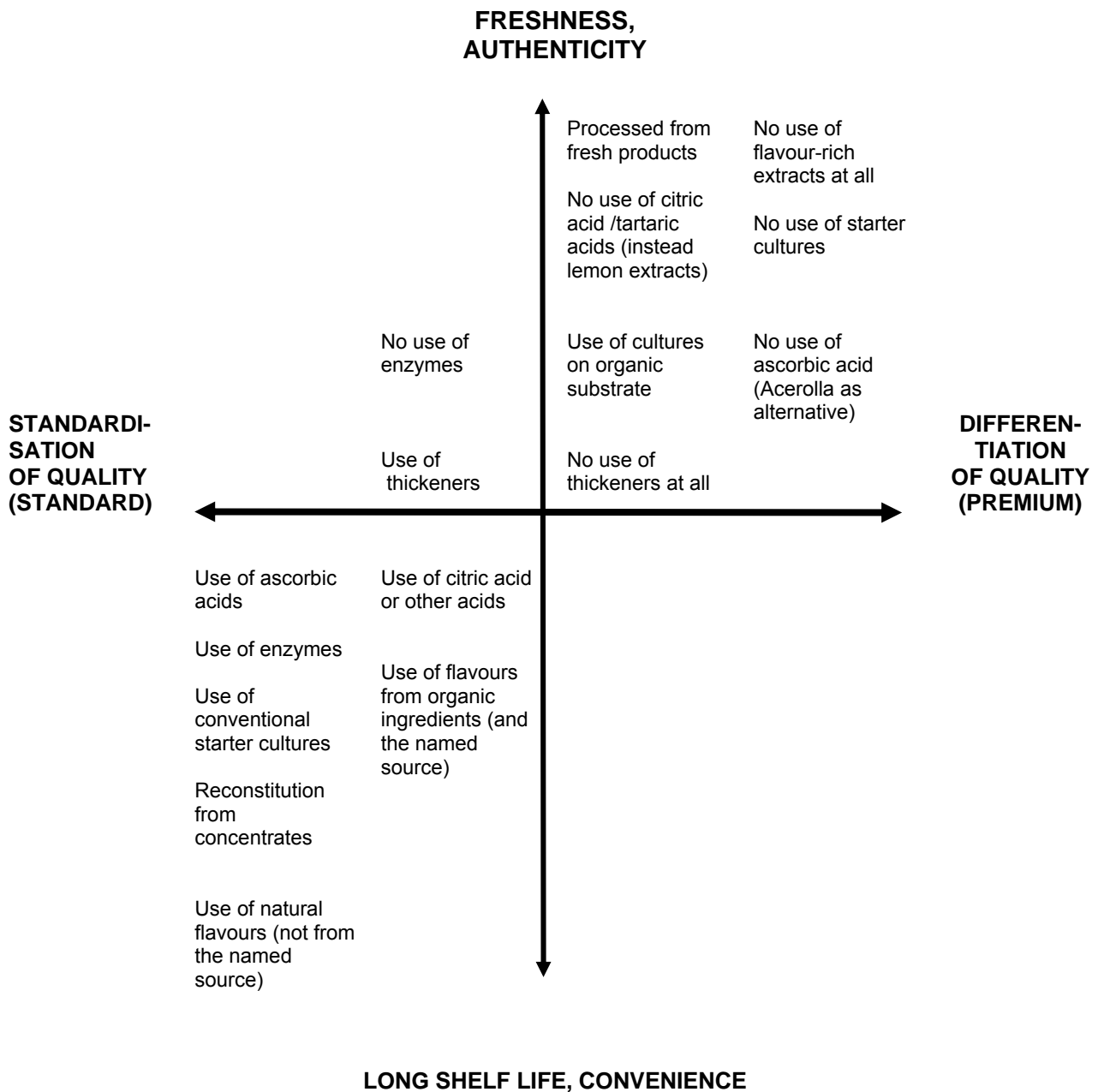
**Table 4.6 Comparison of sensory-relevant regulations and standards requirements for tomato products/sauce**

Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements for production of raw materials</b>	None specified				
<b>Ingredients of agricultural origin</b>	Starch ("native")	<i>Demeter</i> : in organic quality	X	-	X
<b>Ingredients of non-agricultural origin</b>	Salt forms	<i>Nature &amp; Progrès</i> : only sea salt	(X)	X	X
<b>Additives</b>	E 270 Lactic acid	<i>Bio Suisse: A</i> <i>Bioland, Demeter,</i> <i>Naturland, Nature &amp; Progrès</i> : not allowed.	X	X	X

<b>Relevant standards issues for sensory properties</b>	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	<i>Private organic standards If more restrictive than EU</i>	Sensory impact	Freshness / Authenticity	Differentiation of quality
	E 330 Citric acid	<i>Bio Suisse, Demeter, Nature &amp; Progrès: not allowed Bioland, Naturland: Only for few products</i>	X	X	X
	Preservatives such as E 300 Ascorbic acid, etc.	<i>Bio Suisse, Demeter, Nature &amp; Progrès: not allowed Bioland, Naturland: yes, but restricted to few products</i>	X	X	X
	Plant-based thickeners: E 406 Agar agar, E410 Locust beam gum, E412 Guar gum, E 440 Pectin	<i>Bio Suisse, Demeter: not allowed Bioland, Naturland: allowed</i>	X	X	X
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	<i>All private labels: allow O<sub>2</sub> and CO<sub>2</sub></i>	-	-	-
	Natural flavours	<i>Bio Suisse, Demeter, Nature &amp; Progrès: Not allowed</i>	X	X	X
	Starter cultures (bacteria)		X		
	Enzymes	<i>Bio Suisse, Bioland, Demeter, Naturland: allowed</i>	?	X	X
	Ion exchange resins	<i>Bio Suisse, Bioland, Naturland: not allowed</i>	X	-	X
<b>Processing methods</b>	Physical treatments (cutting, centrifugation etc.)		X		
	Reconstitution	<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès: Not allowed, only fresh juices</i>	X	X	X
<b>Storage</b>	Storage in plastic films during maturation		X		
<b>Packaging</b>	None		(X)	X	X

X relevant impact      - no impact

The different processing approaches for organic tomato products are visualised in Figure 4.6



**Figure 4.6 Typology of differently processed organic tomato products linked to differentiation/standardisation as well as to freshness/long shelf life**

## 4.7 Fruit products

The main focus was on apple juices or mixed apple-fruit juices

### 4.7.1 Apple or mixed fruit juices

Some specific relevant requirements were found mostly in a few private standards.

In Tab. 4.7 the following most important differences between the EU rules for organic production and private standards are summarised being relevant for sensory properties:

Ingredients of agricultural origin:

- Generally there are little differences related to the use of ingredients of agricultural origin.

Ingredients of non-agricultural origin: no relevant differences.

Additives:

- Several private standards exclude the **use of lactic acid, citric acid and ascorbic acid** but other standards restrict their use to a few products.
- Two standards exclude the use of the group of **thickeners**; where as other standards do allow it.

Processing aids and other substances:

- Two standards exclude the use of **natural flavours**, whereas other standards require that they are produced from the name-giving substance.
- **Enzymes** are allowed by a majority of standards.
- **Ion exchange resins** are not allowed by a majority of private standards.

Processing methods:

- Several standards exclude the **reconstitution from concentrates**.

More details can be found in Annex I of this document.

**Table 4.7 Comparison of sensory-relevant regulations and standards requirements for apple and fruit juices**

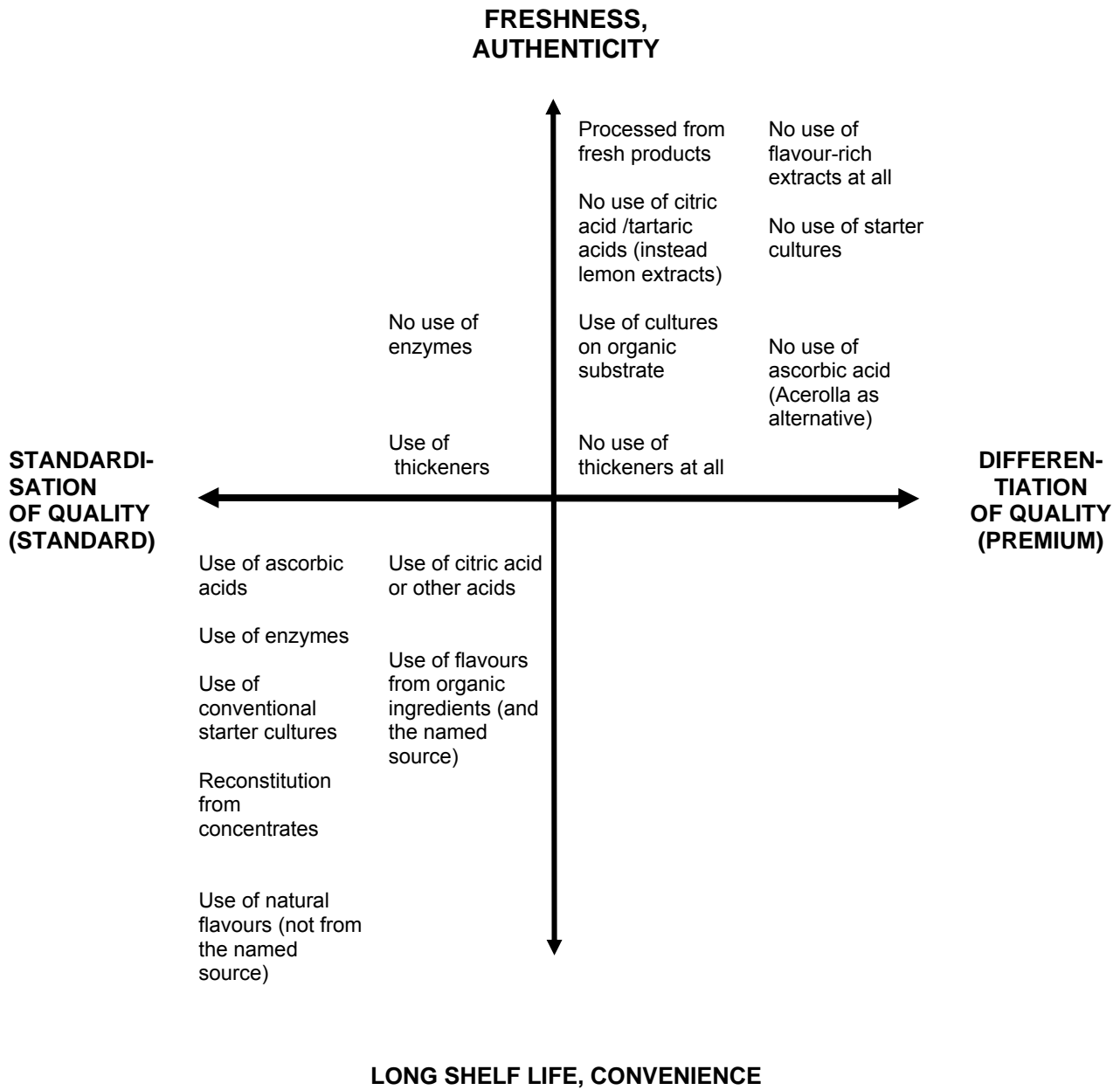
Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>General requirements for production of raw materials</b>	Choice of varieties: no requirements		X		(X)
<b>Ingredients of agricultural origin</b>	Sugar or honey (organic)	AIAB: Sugar only up to 10% referring to the end product	X	(X)	X
	Plant-based ingredients (e.g. herbs)		X	X	X
<b>Ingredients of non-agricultural origin</b>	Salt forms	<i>Nature &amp; Progrès</i> : only sea salt	(X)	X	X



Relevant standards issues for sensory properties	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	Private organic standards If more restrictive than EU	Sensory impact	Freshness / Authenticity	Differentiation of quality
<b>Additives</b>	E 270 Lactic acid	<i>Bio Suisse: A Bioland, Demeter, Naturland, Nature &amp; Progrès: not allowed.</i>	(X)	(X)	(X)
	Preservatives such as E 300 Ascorbic acid, etc.	<i>Bio Suisse, Demeter: Not allowed; Bioland, Naturland, Nature &amp; Progrès: allowed</i>	X	X	X
	E 330 Citric acid	<i>Bio Suisse: Not allowed, only for syrup Nature &amp; Progrès: not allowed</i>	X	X	X
	E 440i Pectin (not amidated)		X		
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	<i>All private labels: allow O<sub>2</sub> and CO<sub>2</sub></i>			
	Albumin		X		
	Casein		X		
	Food grade gelatine		X		
	Bentonite and Diatomaceous earth		X		
	Starter cultures (bacteria)		X	X	X
	Enzymes	<i>Bio Suisse: only Pectinase Bioland,, Naturland: on permission</i>	?	X	X
	Ion exchange resins	<i>Bio Suisse, Bioland, Naturland: not allowed</i>	?	X	X
	Use of sulphur dioxide or sulphate solution	<i>Bio Suisse, Bioland, Demeter Naturland, Nature &amp; Progrès: not allowed for fruit treatment</i>	X	X	X
<b>Processing methods</b>	Physical treatments (cutting, straining, etc.)		X		
	Heat treatment: pasteurization/ sterilization	<i>Bio Suisse: No sterilization</i>	X		
	Deep freezing		X		
	Fermentation		X		
	Reconstitution	<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès: Not allowed, only fresh juices</i>	X	X	X
	Filtering	<i>Bio Suisse, Bioland, Naturland: Asbest-free filters</i>	?	-	-
	Chemical extraction	<i>Bio Suisse, Bioland, Naturland: Not allowed</i>	X	X	X
<b>Storage</b>	Storage in plastic films during maturation		X	-	-
	Storage in controlled atmosphere		(X)	-	-
<b>Packaging</b>	none		(X)	X	X

X relevant impact      - no impact

The different processing approaches for organic fruit juices are visualised in Figure 4.7



**Figure 4.7 Typology of differently processed organic fruit juices linked to differentiation/standardisation as well as to freshness/long shelf life**

## 5 Discussion of the analysis

The analysis of standards and the comparison with the EU rules for organic production has shown significant differences, in particular with regard to the use of additives and flavours. This does not mean that the EU Regulation is per se on a lower level with their requirements. But it shows that as a result of different traditions of private standards and different preferences of some consumer segments, that a market differentiation has developed, which is reflected in different standards requirements on a product group level. As already shown in the literature review by Schmid et al. (2004) different concepts and standards requirements have been developed in the area of organic food processing.

As a consequence of specific restrictions in the standards, innovative processors have developed ways how to produce high quality products with little use of additives and careful processing methods, which result in a high degree of authenticity and differentiation from standardised products. Some of the most challenging examples are described below.

### 5.1 Ingredients of agricultural and non-agricultural origin

The analysis has shown that for some product groups the selection of the basic ingredients play an important role for the sensory properties. The EU regulations for organic production allow to use a broad range of ingredients. However some private standards and companies restrict the use of specific categories of ingredients.

There are two kinds of ingredients, which have significant implications both on the sensory properties but also to the strategic positioning of the products with regard to differentiation and freshness/authenticity: the use of flavour-rich extracts and the use of colouring ingredients.

#### a. Use or non-use of flavour extracts and its implications

The non-use of flavour extracts, e.g. in yoghurts reduces the flavour intensity and the possibility of some taste varieties but favours the use of raw materials with good taste and new fruit compositions. Some consumers might prefer to find the original taste of fruit or vegetables, whereas other consumer segments prefer a more standardised type of flavour, which is more likely to be produced by the use of a broader range of natural flavours.

This would be preferences to be tested with consumers within the ECROPOLIS project, ideally with fruit yoghurts (e.g. strawberry yoghurts).

#### b. Use or non-use of colouring ingredients.

A similar challenge is the use or non-use of ingredients with a strong colouring effects (e.g. like beetroot or grape extracts in fruit yoghurts), which at least by one private standard (Bio Suisse) is excluded. Again for some consumer segments preference might different, which could be explored.

### 5.2 Additives and other substances

Although the EU rules for organic production have already a very limited list of additives, the comparison has shown that some private standards use almost only half of these substances with specific consequences.

#### **a. Non-use of nitrates and nitrites in meat products**

Several standards do exclude the use of nitrites and nitrates in meat production. The non-use of nitrates and nitrites means for the processor that more attention has to be given to avoid food safety problems in particular on small-scale level. And processors have to find innovative ways that the meat products look still attractive, e.g. by using specific ingredients in combination with good communication measures or shorter shelf life best before dates.

#### **b. Non use of certain antioxidants**

Some standards exclude the use of antioxidants like ascorbic acid by giving preference to the use of natural substances with antioxidants effects (like Acerolla berries, rosmarine extract in meat products).

This might slightly but not necessary always influence the taste of the products, which would be interested to be tested.

#### **c. Alternative thickeners in milk products.**

A few standards limited the use of thickeners in particular for milk products with the idea that milk products deliver it thickening agents (e.g. milk powder, milk protein etc.). These might result in different sensory profiles, which might be interesting to test.

### **5.3 Processing methods**

The EU regulations for organic food and farming have until not limited processing methods with the exception of irradiation. However some private standards have started to define more explicitly “processing with care”, as mentioned in EC Regulation 83/2007.

#### **a. Careful processing of oil**

There are a number of challenges, when cold pressed oils are pressed and stored, in particular with regard to shelf life.

#### **b. “Direct” juices instead of concentrate-based juices**

Although several standards exclude the reconstitution of fruit juices, this might pose some logistic challenges and seasonal fluctuations.

These examples should help to find interesting choices for sensory testing.

## 6 Synthesis

The main focus of the analysis was on the most relevant differences between the EU rules for organic production, governmental rules and private standards, which are relevant for sensory properties.

The standard comparison of five private national standards in France, Germany, Italy and Switzerland and three international standards (IFOAM, Codex Alimentarius and Demeter International) showed that the most significant differences are:

- the use or non-use of ingredients in particular with flavour and colour compounds;
- the use or non-use of specific thickeners in particular for milk-products and vegetable/fruit products;
- the use or non- use of nitrate/nitrites in meat products;
- the use or non-use of natural flavours (e.g. for yoghurts, juices or bakery products);
- the use of organic yeast (mainly for bakery products);
- The exclusion of some processing methods like high-temperature processing of oils or of milk.

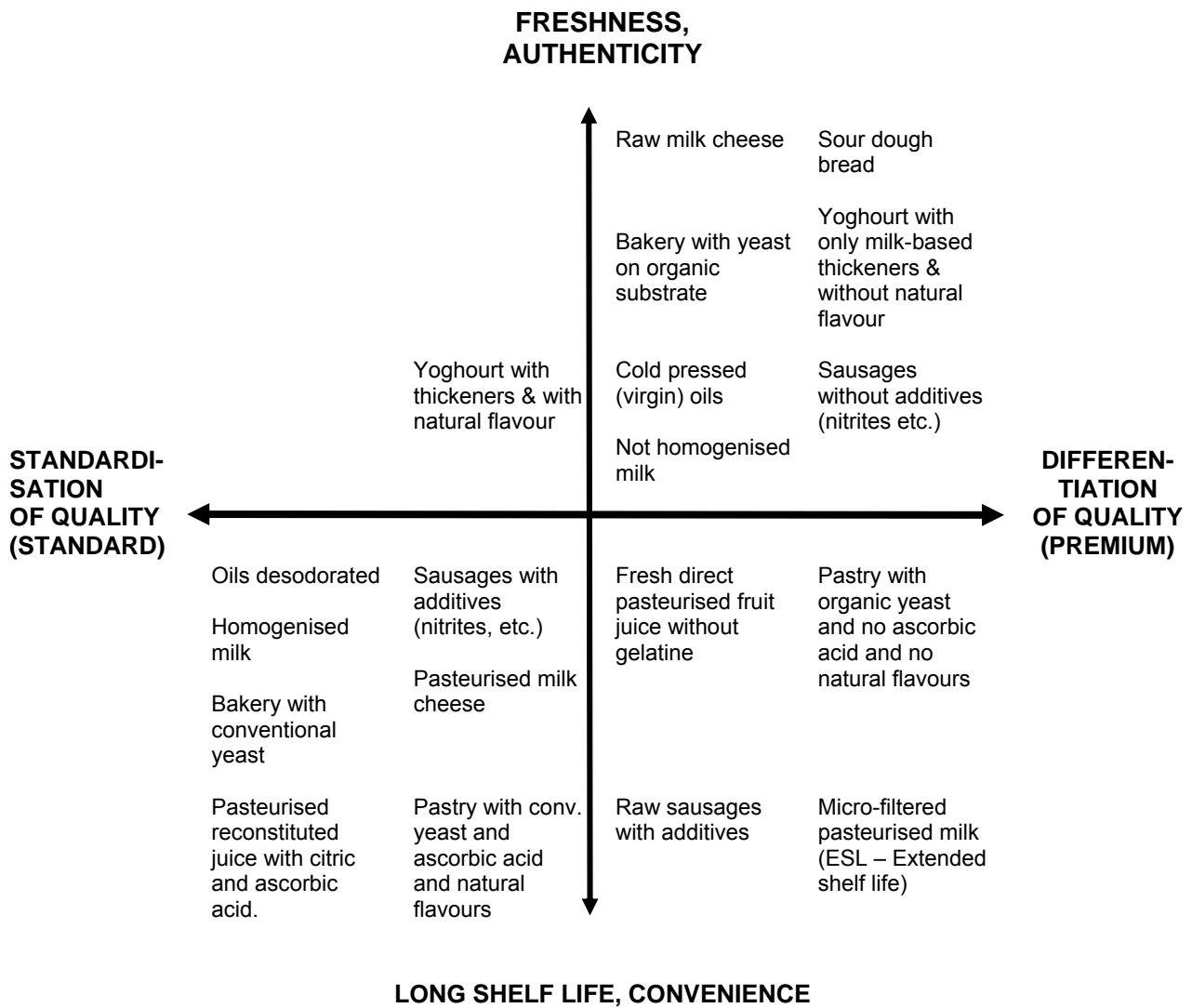
In the analysis a preliminary assessment was made how the different restrictions might impact sensory properties. Furthermore these differences were linked to a typology, were products are differentiated in different segments.

Along horizontal axis 1 are some more standard products and others more premium products. On the vertical axis 2 there are products positioned with a long shelf life and vice versa products with freshness/authentic character.

Some of the different relevant product differences were grouped in these 4 segments.

When making sensory testing it is important to take into account to what typology of products the different products belong. Such a typology might also be helpful, when comparing preferences of different consumer segments.

In the Figure 6.1 some of the most striking examples of different strategic positioning and approaches for a few of the selected product groups and their impact are summarised.



**Figure 6.1 Typology of processed organic products linked to differentiation/standardisation as well as to freshness/long shelf life.**

## 7 References

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## b. Links to organic standards

Country		General and Production standards	Detailed standards for processing
CH	Bio Suisse (2009)	Only in German, French, Italian: <a href="http://www.bio-suisse.ch/media/de/pdf2009/RL-Ws/rl_2009_d.pdf">http://www.bio-suisse.ch/media/de/pdf2009/RL-Ws/rl_2009_d.pdf</a>	Only in German and in French: <a href="http://www.bio-suisse.ch/media/de/pdf2009/RL-Ws/weisungen-liz_2009_d.pdf">http://www.bio-suisse.ch/media/de/pdf2009/RL-Ws/weisungen-liz_2009_d.pdf</a>
DE	Bioland (2008)	<a href="http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/Bioland-Richtlinien_Englisch-2008.pdf">http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/Bioland-Richtlinien_Englisch-2008.pdf</a>	<a href="http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/standards_foer_processing.zip">http://www.bioland.de/fileadmin/bioland/file/bioland/qualitaet_richtlinien/standards_foer_processing.zip</a> All detailed processing standards only in German: <a href="http://www.bioland.de/bioland/richtlinien/hersteller-richtlinien.html">http://www.bioland.de/bioland/richtlinien/hersteller-richtlinien.html</a>
DE	Naturland (2008)	<a href="http://www.naturland.de/fileadmin/MDB/documents/Richtlinien_englisch/Naturland-Standards-on-Production_2008-11.pdf">http://www.naturland.de/fileadmin/MDB/documents/Richtlinien_englisch/Naturland-Standards-on-Production_2008-11.pdf</a>	<a href="http://www.naturland.de/fileadmin/MDB/documents/Richtlinien_englisch/Naturland-Processing-Standards_2008-11.pdf">http://www.naturland.de/fileadmin/MDB/documents/Richtlinien_englisch/Naturland-Processing-Standards_2008-11.pdf</a>
FR	Nature et Progres (2005)	<a href="http://www.natureetprogres.org/producteurs/cahier_des_charges.html">http://www.natureetprogres.org/producteurs/cahier_des_charges.html</a>	<a href="http://www.natureetprogres.org/servicepro/sp42.pdf">http://www.natureetprogres.org/servicepro/sp42.pdf</a>
IT	AIAB (1992-96, rev. 2000)	New webpage from August 2009 on:	<a href="http://www.aiab.it/index.php?option=com_content&amp;view=article&amp;id=27&amp;Itemid=119">http://www.aiab.it/index.php?option=com_content&amp;view=article&amp;id=27&amp;Itemid=119</a>
IT	Bioagricert – IOS (Italian Organic Standard, 2004)	Crop Production: <a href="http://www.bioagricert.org/english/files/IOS%20Crop%20Production%202.pdf">http://www.bioagricert.org/english/files/IOS%20Crop%20Production%202.pdf</a>  Livestock: <a href="http://www.bioagricert.org/english/files/IOS%20Livestock.pdf">http://www.bioagricert.org/english/files/IOS%20Livestock.pdf</a>	<a href="http://www.bioagricert.org/english/files/IOS%20Processing.pdf">http://www.bioagricert.org/english/files/IOS%20Processing.pdf</a>
NL	SKAL (2009)	<a href="http://www.skal.nl/Portals/0/Nederlands/PDF/OrgProdNL.pdf">http://www.skal.nl/Portals/0/Nederlands/PDF/OrgProdNL.pdf</a>	none
United Kingdom	Soil Association (2009)	<a href="http://92.52.112.178/web/sacert/sacertweb.nsf/e8c12cf77637ec6c80256a6900374463/4d7054234b8da20a8025740b0012f83f/\$FILE/ATTW3W7S/Soil%20Association%20Organic%20Standards%20for%20Producers%202009.pdf">http://92.52.112.178/web/sacert/sacertweb.nsf/e8c12cf77637ec6c80256a6900374463/4d7054234b8da20a8025740b0012f83f/\$FILE/ATTW3W7S/Soil%20Association%20Organic%20Standards%20for%20Producers%202009.pdf</a>	<a href="http://92.52.112.178/web/sacert/sacertweb.nsf/e8c12cf77637ec6c80256a6900374463/4d7054234b8da20a8025740b0012f83f/\$FILE/ATT8WH7C/Soil%20Association%20Organic%20Standards%20for%20Processors%202009.pdf">http://92.52.112.178/web/sacert/sacertweb.nsf/e8c12cf77637ec6c80256a6900374463/4d7054234b8da20a8025740b0012f83f/\$FILE/ATT8WH7C/Soil%20Association%20Organic%20Standards%20for%20Processors%202009.pdf</a>
Int.	Demeter	<a href="http://demeter.net/standards/st_production_e08.pdf">http://demeter.net/standards/st_production_e08.pdf</a>	<a href="http://demeter.net/standards/st_processing_e08.pdf">http://demeter.net/standards/st_processing_e08.pdf</a>
Int.	Codex Alimentarius (2008)	<a href="http://www.Codexalimentarius.net/download/standards/360/CXG_032e.pdf">http://www.Codexalimentarius.net/download/standards/360/CXG_032e.pdf</a>	same
Int.	IFOAM (2005)	<a href="http://www.ifoam.org/about_ifoam/standards/norms.html">http://www.ifoam.org/about_ifoam/standards/norms.html</a>	<a href="http://www.ifoam.org/about_ifoam/standards/pdfs/20080423_IFOAM_Indicative_List.pdf">http://www.ifoam.org/about_ifoam/standards/pdfs/20080423_IFOAM_Indicative_List.pdf</a>



### c. Links to non-organic standards in Codex Alimentarius

Product groups	Codex Alimentarius Standards/Guidelines
Yoghurt	<a href="http://www.Codexalimentarius.net/download/standards/400/CXS_243e.pdf">http://www.Codexalimentarius.net/download/standards/400/CXS_243e.pdf</a>
Soft cheese: general Camembert	<a href="http://www.Codexalimentarius.net/download/standards/364/CXS_222e.pdf">http://www.Codexalimentarius.net/download/standards/364/CXS_222e.pdf</a> <a href="http://www.Codexalimentarius.net/download/standards/218/CXS_276e.pdf">http://www.Codexalimentarius.net/download/standards/218/CXS_276e.pdf</a>
Salami	Nothing found
Olive oils	<a href="http://www.Codexalimentarius.net/download/standards/88/CXS_033e.pdf">http://www.Codexalimentarius.net/download/standards/88/CXS_033e.pdf</a>
Other oils	<a href="http://www.Codexalimentarius.net/download/standards/74/CXS_019e.pdf">http://www.Codexalimentarius.net/download/standards/74/CXS_019e.pdf</a>
Tomato concentrate/ sauce	<a href="http://www.Codexalimentarius.net/download/standards/74/CXS_019e.pdf">http://www.Codexalimentarius.net/download/standards/74/CXS_019e.pdf</a> or <a href="http://www.Codexalimentarius.net/download/standards/237/CXS_057e.pdf">http://www.Codexalimentarius.net/download/standards/237/CXS_057e.pdf</a>
Fruit juice	<a href="http://www.Codexalimentarius.net/download/standards/10154/CXS_247e.pdf">http://www.Codexalimentarius.net/download/standards/10154/CXS_247e.pdf</a>

## 8 Fact sheets for different product groups

The following tables give a detailed description of the requirements of the different regulations and standards. The baseline is the EC Regulation 834/2007 and in particular the implementing rules EC 889/2008.

For each product group the ingredients of agricultural and non-agricultural origin as well as the both the processing aids and other substances and the processing methods are compared.

Potential implication of the requirement on the sensory profile (texture, taste and odour and colour) and the shelf life are indicated as an example only for milk products. This is an indicative assessment of the impact on sensory properties and shelf life, which has to be verified, when relevant in the project.

The numbering refers to the description of the different categories in chapter 4.

## 8.1 Milk products

Among the chosen milk products were yoghurts and soft cheese.

### 8.1.1 Yoghurts

As already outlined, there are different issues restricted or not allowed in certain regulations and standards for organic production and processing. The baseline is the EU regulations for organic production. Only when specific restrictions are required these are mentioned in Table 4.1.

**Table 4.1 Comparison of sensory-relevant regulations and standards requirements for yoghurts**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM)	Requirements/ guidelines of private firms	Potential impact on sensory properties*				Other impact
							texture	flavour		colour	
								taste	odour		
<b>General requirements agric. production</b>	Feeding of animals, pasture	Pasture required for ruminants		<i>Nature &amp; Progrès: no silage</i>			-	X	(X)	ev.	
<b>Ingredients of agricultural origin</b>	Milk with different fat contents	A					X	X	-	-	
	Milk cream addition	A					X	X	-	-	
	Milk (or other milk based) powder	A					X	X	-	-	
	Milk protein powder	A					X	X	-	-	
	Fruit and vegetables, etc.	A					X	X	X	X	
	Other plant based ingredients	A					X	X	X	X	
	Sugar or honey (organic)	A					X	X	X	X	

	Starch based compounds	A		<i>Bio Suisse:</i> Only native rice based starch <i>Bioland,</i> <i>Naturland:</i> A <i>Demeter:</i> only for puddings			X	X	-	-	
	Colouring ingredients (red beet, or grape juice concentrate)	A		<i>Bioland,</i> <i>Naturland:</i> A <i>Bio Suisse:</i> Not allowed			-	-	-	X	
	Extracts from flavour rich compounds	A		<i>Bioland,</i> <i>Demeter,</i> <i>Naturland:</i> A <i>Bio Suisse:</i> Not allowed			-	X	X	X	
<b>Ingredients of non-agricultural origin</b>	Salt forms	No specification		<i>Nature &amp; Progrès:</i> only sea salt			-	X	-	-	
<b>Additives</b>	E 270 Lactic acid	Allowed for the brine bath in cheese production		<i>Nature &amp; Progrès, Bio Suisse:</i> Not allowed			-	-	-	-	
	Non-milk based thickeners: E 400-E402 Alginates, E 406 Agrar agar, E 407 Carrageenan, E410 Locust bean gum E 412 Guar Gum	A with some restrictions regarding milk products		<i>Nature &amp; Progrès, Bio Suisse:</i> Not allowed at all <i>Bioland,</i> <i>Demeter,</i> <i>Naturland:</i> no Alginates			X	X	-	-	
	E440 Pectin for fruit based ingredients	A		A			X	X	-	-	
<b>Processing aids and other substances</b>	Starter cultures (yoghurt bacteria, etc.)	A					X	X	(X)	-	Shelf life

	Natural flavours	A		<i>Bio Suisse, Demeter</i> Not allowed <i>Bioland, Naturland, Nature &amp; Progrès, BNN::</i> Natural flavouring agents from vegetable (name-giving) food if possible organic			-	X	-	-	Shelf life
<b>Processing methods</b>	Change of fat content through centrifugation or cream addition	A			A	-	X				
	Pasteurisation	A		<i>Bio Suisse: non-peroxydase positive</i>	A		X	X	-	-	Shelf life
	Higher dry matter content through hydration	A			A		X	-	-	-	
	Homogenisation of milk	A		<i>Nature &amp; Progrès: not allowed</i> <i>Bio Suisse: max. 250 bar</i> <i>Demeter: only homogenisation by a centrifuge (no homogeniser)</i>	A	Some companies: do not allow	X	X	-	-	
	Second heat treatment after fermentation	A		<i>Nature &amp; Progrès, Bio Suisse: not allowed</i>	?		-	(X)	-	-	
<b>Packaging</b>	No details										

A = (generally) allowed under general EU and/national food laws

X Relevant impact

\* indicative assessment of the impact on sensory properties and shelf life – to be verified, when relevant

## 8.1.2 Soft cheese

Like with yoghurt there were some specific relevant requirements found mostly in a few private standards.

**Table 4.2 Comparison of sensory-relevant regulations and standards requirements for soft cheese**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM)	Requirements/ guidelines of private firms	Potential impact on sensory properties*			Other impact	
							texture	flavour			colour
								taste	odour		
<b>General requirements</b>	Feeding of animals, pasture	Pasture required for ruminants		<i>Nature &amp; Progrès</i> : no silage							
<b>Ingredients of agricultural origin</b>	Milk from different cows/herds/ breeds	A					-	X	-	-	
	Milk cream addition	A					X	X	-	-	
	Milk (or other milk based) powder	A					X	X	-	-	
	Sugar and honey (organic)	A					-	X	-	(X)	
	Plant-based ingredients (e.g. herbs)	A		<i>AIAB</i> : Organic vegetable oils for shapes defining			-	X	X	X	
	Extracts from flavour rich compounds	A		<i>Bioland</i> , <i>Demeter</i> , <i>Naturland</i> : A <i>Bio Suisse</i> : Not allowed			-	X	X	X	
<b>Ingredients of non-agricultural origin</b>	Salt forms (not specified)	A		<i>AIAB</i> : for ricotta Epsom salts (Epsomite) is allowed <i>Nature &amp;</i>			-	X	-	-	Shelf life

				<i>Progrès</i> : only sea salt							
	Change of content trough addition of water	A					X	X	-	-	
<b>Additives</b>	Colorants: E 153 vegetable carbon, E 160b Annatto, Bixin, Norbixin	Several allowed for special cheeses		<i>Bio Suisse, Demeter</i> : not allowed <i>Nature &amp; Progrès</i> : A			-	-	X	-	
	E 170 Calcium Carbonate	A		<i>Bio Suisse</i> : only in salt <i>Bioland, Demeter, Naturland</i> : only for sour milk cheese			-	-	-	-	
	E 509 Calcium chloride	A		<i>Bio Suisse</i> : Restricted for pasteurized milk <i>Bioland</i> : Not allowed <i>Demeter, Naturland Nature &amp; Progrès</i> : A			-	(X)	-	-	
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	A					-	-	-	-	
	pH-regulators in brine (salt) baths: Lactic acid, citric acid, (hydrochloric acid)	Only for brine salt bath (hydrochloric acid for special cheese)		<i>Bio Suisse</i> : Only lactic acid for brine bath			-	-	-	-	
	Citric acid	Only for brine salt bath		<i>AIAB</i> : for Ricotta cheese allowed with rennet <i>Bio Suisse</i> : Not allowed for brine salt bath			-	X	-	-	

	Cheese cultures (starter bacteria, cultures for surface treatment etc.)	A					X	X	-	-	
	Rennet (with no preservatives)	A		A			-	-	-	-	
	Natural flavour extracts	A		<i>Bio Suisse, Demeter:</i> Not allowed			-	X	X	-	
	Surface treatments with plastic PVA (Polyvinyl acetate) dispersions for cutting and semi-hard cheese.	A		<i>Bio Suisse: not allowed</i>  <i>Bioland, Demeter, Naturland:</i> allowed			-	X	-	-	Shelf life
<b>Processing methods</b>	Pasteurisation	Aa					-				
	Thermisation	A					-	-	-	-	Shelf life
	Bactofugation	A					-	-	-	-	Shelf life
	UHT Treatment or sterilisation	A		<i>Bio Suisse, Demeter, Naturland: not allowed</i>			-	X	-	-	Shelf life
	Change of fat content through ultrafiltration	A		<i>Bio Suisse, Naturland:</i> Ultrafiltration excluded			-	(X)	-	-	
	Change of fat content through addition/ or removal of cream	A					(X)	X	-	-	
	Smoke	A		<i>Bio Suisse,</i>			-	X	X	X	

				<i>Demeter, Naturland: from untreated wood</i>							
<b>Storage</b>	Storage in plastic films during maturation	A					-	X	-	-	Shelf life
<b>Packaging</b>	Use or non-use of different materials	Not specified		<i>AIAB, Bioland, Demeter, Naturland: positive list</i>			-	(X)	-	-	Shelf life

A = (generally) allowed under general EU and/national food laws      X Relevant impact      - no impact

\* indicative assessment of the impact on sensory properties and shelf life – to be verified, when relevant



## 8.2 Meat products

In the project the main focus was on Salami.

### 8.2.1 Salami

Some specific relevant requirements were found mostly in a few private standards.

**Tab. 4.3 Comparison of sensory-relevant regulations and standards requirements for salami**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM, Demeter)	Requirements/ guidelines of private firms	Potential impact on sensory properties			Other impact	
							texture	flavour			colour
								taste	odour		
<b>General requirements</b>	Feeding regime	Requirements for organic feed									
<b>Ingredients of agricultural origin</b>	Meat – different types	A									
	Plant-based ingredients (e.g. herbs)	A									
	Milk products	A		<i>Nature &amp; Progrès: no lacto-protein.</i>							
	Sugar and honey (organic)	A		A							
	Extracts of flavour rich compounds (e.g. spice extracts)	A		<i>Bio Suisse. Only Rosmarin extract (antioxidative) Demeter: Not allowed</i>							
	Hydrolysed proteins			<i>Nature &amp; Progrès: not allowed.</i>							

	Starch based compounds	A										
<b>Ingredients of non-agricultural origin</b>	Water	A										
	Salt forms	(not specified)		<i>Nature &amp; Progrès: only sea salt</i>								
<b>Additives</b>	E 250 Sodium nitrite (curing salt)	Stricter than for conv.: indicative ingoing amount expressed as NaNO <sub>2</sub> : 80 mg/kg maximum residual amount expressed as NaNO <sub>2</sub> : 50 mg/kg	<i>Germany: Additional restrictions by German Meat regulation.</i>	<i>Bio Suisse: Legal amounts allowed Bioland, Demeter, Nature &amp; Progrès: not allowed. Naturland: 80 mg/kg is mandatory and not only indicative</i>								
	E 252 Potassium nitrate (curing salt)	Stricter than for conv.: indicative ingoing amount expressed as NaNO <sub>2</sub> : 80 mg/kg maximum residual amount expressed as NaNO <sub>2</sub> : 50 mg/kg		<i>Bioland, Demeter, Naturland, Nature &amp; Progrès: Not allowed</i>								
	E 270 Lactic acid			<i>Bio Suisse, Bioland, Demeter; Naturland: for treating natural skins</i>								

	Preservatives such as E 300 Ascorbic acid and Sodium Ascorbates.	A		<i>Bio Suisse, Demeter, Nature &amp; Progrès: Not allowed Naturland: A with E 250</i>								
	E 331 Sodium citrate	A		<i>Bio Suisse: only microbiological origin Bioland, Demeter, Naturland: As eXpedient for processing meat</i>								
	E325 Sodiumlactat	A		<i>Bio Suisse: Not allowed Bioland: for treating natural skins</i>								
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	A										
	Untreated wood compounds for smoking	A										
	Natural flavours	A		<i>Several private standards: not allowed</i>								
	Gelatine	A		<i>Bio Suisse, Bioland, Naturland: Gelatine without additives Nature &amp; Progrès: not allowed</i>								
	Starter cultures (bacteria)	A		<i>Bioland, Naturland: grown on organic substrate, when</i>	A							

				available							
	Enzymes	A		<i>Bio Suisse, Bioland, Naturland Nature &amp; Progrès</i> : not allowed							
<b>Processing methods</b>	Physical treatments (Cutting, heating etc.)	A		<i>Naturland</i> : use of "mechanically recovered meat (MRM) <i>Demeter</i> : no tendering treatments (nor mechanical nor electric)							
	Cooking,	A		<i>Nature et Progrès</i> : Temperature restrictions (69-73° Celsius)							
	Canning	A									
	Curing with smoke of untreated wood	A		<i>Naturland</i> : no black smoking							
	Curing with salt	A		See below nitrates/nitrites							
	Drying	A									
<b>Storage</b>	Storage in plastic films during maturation	A									
<b>Packaging</b>	Natural and artificial skins	A		<i>Bio Suisse, Bioland, Demeter</i> <i>Naturland</i> : both allowed							
	Films or plastic	A		<i>Bioland, Naturland</i> : limited list.							

A = (generally) allowed under general EU and/national food laws

X Relevant impact

- no impact

## 8.3 Cereal based products

In the project the main focus was on bakery products (mainly cookies).

### 8.3.1 Bakery products

Some specific relevant requirements were found mostly in a few private standards.

**Table 4.2 Comparison of sensory-relevant regulations and standards requirements for bakery products**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM, Demeter)	Requirements/ guidelines of private firms	Potential impact on sensory properties			Other impact	
							texture	flavour			colour
								taste	odour		
<b>General requirements</b>	Choice of special varieties	-		none							
<b>Ingredients of agricultural origin</b>	Cereal based ingredients	A									
	Other plant-based ingredients	A		A/IAB: Agar, carob flower, guar seeds flower, kuzu (gelling agents)							
	Other animal-based ingredients	A									
	Starch based ingredients	A									
	Sugar and honey (organic)	A									
	Acerolla cherry	A		<i>Bio Suisse,</i>							

	extract (rich in ascorbic acid)			<i>Demeter</i> : instead of Ascorbic acid							
	Flavour rich extracts	A		<i>Bio Suisse</i> , Not allowed eXcept Rosmarine extract (antioXiditative) <i>AIAB</i> : allowed if labelled <i>Bioland</i> , <i>Demeter</i> <i>Naturland</i> : allowed							
<b>Ingredients of non-agricultural origin</b>	Yeast and yeast replacements			<i>Bio Suisse</i> , <i>Bioland</i> , <i>Nature &amp; Progrès</i> : organic if available <i>AIAB</i> , <i>Naturland</i> : Non-organic allowed							
	Salt forms	Not specified		<i>Nature &amp; Progrès</i> : only sea salt							
	Water	A									
<b>Additives</b>	Preservatives such as E 300 Ascorbic acid, etc.	A		<i>AIAB</i> , <i>Bio Suisse</i> , <i>Bioland</i> , <i>Naturland</i> , <i>Nature &amp; Progrès</i> : Not allowed							
	E322 Lecithin	A		<i>AIAB</i> : Lecithin <i>Bio Suisse</i> , <i>Bioland</i> : only as organic ingredient <i>Naturland</i> : A, native, not modified <i>Nature &amp; Progrès</i> : not allowed							

	E 330 Citric acid	A		<i>Bio Suisse</i> : only microbial origin <i>AIAB, Bioland, Naturland, Nature &amp; Progrès</i> : not allowed							
	E334 Tartaric acid	A		<i>AIAB, Bioland, Naturland</i> : No <i>Bio Suisse, Nature &amp; Progrès</i> : only microbial origin							
	E 335 Sodium Tartrate and E 336 Potassium Tartrate	A		<i>AIAB</i> : only 336 <i>Bioland, Naturland, Nature &amp; Progrès</i> : A <i>Bio Suisse</i> : only microbial origin							
	Other acids, e.g. like E400 Alginic acid	Several acids allowed		<i>AIAB, Bio Suisse, Naturland, Nature &amp; Progrès</i> : no other acids.							
	Plant-based thickeners: E 406 Agar agar, E410 Locust beam gum, E412 Guar gum, E 440 Pectin	Several thickeners allowed		<i>AIAB</i> : only as ingredients <i>Bio Suisse, Nature &amp; Progrès</i> : not allowed <i>Bioland, Naturland</i> : all allowed <i>Demeter</i> : only E406 and E440a							
	E 500-*504 Baking powders (carbonate-based)	A		<i>AIAB, Bio Suisse, Bioland, Naturland</i> : A							
	E 524 Sodium hydroXide	A		<i>AIAB</i> : not allowed <i>Bio Suisse, Bioland, Naturland</i> :							

				allowed for Bretzel type products							
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	A									
	Enzymes	A		<i>Bio Suisse</i> , only amylase and hemicellulase <i>AIAB</i> , <i>Bioland</i> : no enzymes <i>Naturland</i> : Only on basis of grains, leguminous flower and honey							
	Natural flavours	A		<i>AIAB</i> : allowed but obtained through physical extraction <i>Bio Suisse</i> , <i>Bioland</i> <i>Naturland</i> : Not allowed							
	Gelatine	A									
	Cultures (sour dough, other starters, etc.)	A		A							
	Separating substances: e.g. flower, starch, etc. (certified origin); waX (bees or carnauba waX)	A		<i>Bio Suisse</i> : A <i>Bioland</i> <i>Naturland</i> : Only allowed as organic							
<b>Processing methods</b>	Bakery process (heating)	A									
	Deep freezing of compounds before	A		<i>Nature &amp; Progrès</i> : not allowed.							



	processing										
	Extrusion										
	Microwaves			<i>Bio Suisse, Bioland, Demeter Naturland: Not allowed</i>							
<b>Storage</b>	Not specified										
<b>Packaging</b>	Not specified										

A = (generally) allowed under general EU and/national food laws      X Relevant impact      - no impact

## 8.4 Oil products

### 8.4.1 Plant-based oils for direct consumption

Some specific relevant requirements were found mostly in a few private standards.

**Table 4.2 Comparison of sensory-relevant regulations and standards requirements for plant-based oils for direct consumption**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM, Demeter)	Requirements/ guidelines of private firms	Potential impact on sensory properties			Other impact	
							texture	flavour			colour
								taste	odour		
<b>General requirements</b>	none										
<b>Ingredients of agricultural origin</b>	Oil – different types	A									
	Plant-based ingredients (e.g. herbs)	A									
<b>Ingredients of non-agricultural origin</b>											
	Salt forms	No		<i>Nature &amp; Progrès</i> : only sea salt							
<b>Additives</b>	E 330 Citric acid	A		<i>Bio Suisse</i> : only for rape seed oils (for baking) <i>Naturland</i> : only for sunflower							

				seed oil for further processing. <i>Bioland, Nature &amp; Progrès: No</i>							
	E 306 Tocopherol-rich extract	Use as anti-oxidant		<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès: No</i>							
	E 524 Sodium hydroxide	only for rape seed oils		<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès : No</i>							
<b>Processing aids and others substances</b>	Inert gases (O2, CO2, N2)	A									
	Charcoal	A		<i>Bio Suisse, Naturland: only for further processed oil Nature &amp; Progrès: not allowed</i>							
	Natural flavours	A		<i>Bio Suisse, Naturland: not allowed</i>							
	Ethyl-alcohol	A		<i>Naturland: only to extract, when low oil content</i>							
	Enzymes	A		<i>AIAB; Bio Suisse, Bioland; Demeter, Naturland: not allowed</i>							
<b>Processing methods</b>	Physical treatments (cleaning, heating centrifugation, decantation etc.	All methods		<i>AIAB: max. 37 °C Bio Suisse: Cold pressing up to max. 50 °C for processing max.</i>							

				100 °C <i>Bioland,</i> <i>Demeter,</i> <i>Naturland:</i> max. 40 °C for olive oil and max. 60 °C for sunflower oil <i>Nature&amp;Progres:</i> max. 40 °C							
<b>Storage</b>	None										
<b>Packaging</b>	none										

A = (generally) allowed under general EU and/national food laws

X Relevant impact

- no impact

## 8.5 Vegetable products

The main focus was on tomato sauce.

### 8.5.1 Tomato sauce/products

Some specific relevant requirements were found mostly in a few private standards.

**Tab. 4.2 Comparison of sensory-relevant regulations and standards requirements for tomato sauce**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM, Demeter)	Requirements/ guidelines of private firms	Potential impact on sensory properties			Other impact	
							texture	flavour			colour
								taste	odour		
General requirements for production of raw materials	none										
Ingredients of agricultural origin	Tomatoes different varieties										
	Sugar or honey (organic)										
	Plant-based ingredients (e.g. herbs)										
	Glucose syrup			<i>Nature&amp;Progres: not allowed</i>							
	Milk-based ingredients (e.g. whey)										
	Starch ("native")			<i>Demeter: in organic quality</i>							

<b>Ingredients of non-agricultural origin</b>	Water	A										
	Salt forms	A		<i>Nature &amp; Progrès: only sea salt</i>								
<b>Additives</b>	E 270 Lactic acid	A		<i>Bio Suisse: A Bioland, Demeter, Naturland, Nature &amp; Progrès: not allowed.</i>								
	E 330 Citric acid	A		<i>Bioland Naturland: Only for few products Bio Suisse, Demeter, Nature &amp; Progres: not allowed</i>								
	Preservatives such as E 300 Ascorbic acid, etc.	A		<i>Bio Suisse, Demeter, Nature &amp; Progres: Not allowed Bioland, Naturland: yes, but restricted to few products</i>								
	Plant-based thickeners: E 406 Agar agar, E410 Locust beam gum, E412 Guar gum, E 440 Pectin	A		<i>Bio Suisse, Demeter: not allowed Bioland, Naturland: allowed</i>								
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	A		<i>All private labels: allow O<sub>2</sub> and CO<sub>2</sub></i>								
	Natural flavours	A		<i>Bio Suisse,</i>								

				<i>Demeter, Nature &amp; Progrès: Not allowed</i>							
	Starter cultures (bacteria)	A									
	Enzymes	A		<i>Bio Suisse: not allowed Bioland, Demeter, Naturland: allowed</i>							
<b>Processing methods</b>	Physical treatments (cutting, centrifugation etc.)	A									
	Reconstitution			<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès: Not allowed, only fresh juices</i>							
<b>Storage</b>	Storage in plastic films during maturation	A									
<b>Packaging</b>	None										

A = (generally) allowed under general EU and/national food laws      X Relevant impact      - no impact

## 8.6 Fruit products

The main focus was on apple juices or mixed apple-fruit juices

### 8.6.1 Apple or mixed fruit juices

Some specific relevant requirements were found mostly in a few private standards.

**Tab. 4.2 Comparison of sensory-relevant regulations and standards requirements for apple and fruit juices**

Relevant standards issues for sensory properties	Relevant restriction or general allowance	EU Regulations (if not mentioned otherwise EU Reg 884/2008)	National standards if more restrictive as EU	Private organic standards If more restrictive than EU	Other internat. Standards (Codex, IFOAM, Demeter)	Requirements/ guidelines of private firms	Potential impact on sensory properties			Other impact	
							texture	flavour			colour
								taste	odour		
<b>General requirements for production of raw materials</b>	Choice of varieties	No requirement									
<b>Ingredients of agricultural origin</b>	Apples	A									
	Sugar or honey (organic)	A		A/AB: Sugar only up to 10% referring to the end product							
	Plant-based ingredients (e.g. herbs)	A									
<b>Ingredients of non-agricultural origin</b>	Water	A									
	Salt forms	A		Nature & Progrès: only sea							



				salt							
	Starter cultures (bacteria)	A									
<b>Additives</b>	E 270 Lactic acid	A		<i>Bio Suisse: A Bioland, Demeter, Naturland, Nature &amp; Progrès: not allowed.</i>							
	Preservatives such as E 300 Ascorbic acid, etc.	A		<i>Bio Suisse, Demeter: Not allowed Bioland, Naturland, Nature &amp; Progrès: allowed</i>							
	E 330 Citric acid	A		<i>Bio Suisse: Not allowed, only for syrup Nature &amp; Progrès: not allowed</i>							
	E 440i Pectin (not amidated)	A									
<b>Processing aids and others substances</b>	Inert gases (O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> )	A		<i>All private labels: allow O<sub>2</sub> and CO<sub>2</sub></i>							
	Casein, Albumine	A									
	Food grade gelatine	A									
	Bentonite and Diatomaceous earth	A									
	Enzymes	A		<i>Bio Suisse: only Pectinase Bioland,, Naturland: on permission</i>							
	Ion eXchange resins	Not clearly defined		<i>Bio Suisse, Bioland,</i>							

				<i>Naturland</i> : not allowed							
	Use of sulphur dioxide or sulphate solution	A		<i>Bio Suisse, Bioland, Demeter Naturland, Nature &amp; Progrès</i> : not allowed for fruit treatment							
<b>Processing methods</b>	Physical treatments (cutting, etc.)	A									
	Heat treatment: pasteurization/sterilization	A		<i>Bio Suisse</i> : No sterilization							
	Deep freezing	A									
	Fermentation	A									
	Reconstitution	A		<i>Bio Suisse, Bioland, Naturland, Nature &amp; Progrès</i> : Not allowed, only fresh juices							
	Filtering	A		<i>Bio Suisse, Bioland, Naturland</i> : Asbest-free filters							
	Chemical extraction	Preference for physical extraction		<i>Bio Suisse, Bioland, Naturland</i> : Not allowed	<i>Demeter, IFOAM</i> : not allowed						
<b>Storage</b>	Storage in plastic films during maturation	A									
	Storage in controlled atmosphere	A									
<b>Packaging</b>	none										

A = (generally) allowed under general EU and/national food laws      X Relevant impact      - no impact

# Annex I. EC Regulation 889 2008 list of products and substances for processing organic food in Annex VIII

## Annex VIII

### Certain products and substances for use in production of processed organic food referred to in Article 27(1)(a)

A: authorised under Regulation (EEC) No 2092/91 and carried over by Article 21(2) of Regulation (EC) No 834/2007

B: authorised under Regulation (EC) No 834/2007

#### **SECTION A — FOOD ADDITIVES, INCLUDING CARRIERS**

For the purpose of the calculation referred to in Article 23(4)(a)(ii) of Regulation (EC) N° 834/2007, food additives marked with an asterisk in the column of the code number, shall be calculated as ingredients of agricultural origin.

Authorisation	Code	Name	Preparation of foodstuffs of		Specific conditions
			plant origin	animal origin	
A	E 153	Vegetable carbon		X	Ashy goat cheese Morbier cheese
A	E 160b*	Annatto, Bixin, Norbixin		X	Red Leicester cheese Double Gloucester cheese Cheddar Mimolette cheese
A	E 170	Calcium carbonate	X	X	Shall not be used for colouring or calcium enrichment of products
A	E 220 Or E 224	Sulphur dioxide  Potassium metabisulphite	X  X	X  X	In fruit wines (*) without added sugar (including cider and perry) or in mead: 50 mg (**) For cider and perry prepared with addition of sugars or juice concentrate after fermentation: 100 mg (**) (* In this context, "fruit wine" is defined as wine made from fruits other than grapes. (**) Maximum levels available from all sources, expressed as SO <sub>2</sub> in mg/l.

Authorisation	Code	Name	Preparation of foodstuffs of		Specific conditions
			plant origin	animal origin	
A	E 250 or E 252	Sodium nitrite Potassium nitrate		X  X	For meat products <sup>(2)</sup> : For E 250: indicative ingoing amount expressed as NaNO <sub>2</sub> : 80 mg/kg For E 252: indicative ingoing amount expressed as NaNO <sub>3</sub> : 80 mg/kg For E 250: maximum residual amount expressed as NaNO <sub>2</sub> : 50 mg/kg For E 252: maximum residual amount expressed as NaNO <sub>3</sub> : 50 mg/kg
A	E 270	Lactic acid	X	X	
A	E 290	Carbon dioxide	X	X	
A	E 296	Malic acid	X		
A	E 300	Ascorbic acid	X	X	Meat products <sup>(1)</sup>
A	E 301	Sodium ascorbate		X	Meat products <sup>(1)</sup> in connection with nitrates and nitrites
A	E 306*	Tocopherol-rich extract	X	X	Anti-oxidant for fats and oils
A	E 322*	Lecithins	X	X	Milk products <sup>(1)</sup>
A	E 325	Sodium lactate		X	Milk-based and meat products
A	E 330	Citric acid	X		
A	E 331	Sodium citrates		X	
A	E 333	Calcium citrates	X		
A	E 334	Tartaric acid (L(+)-)	X		
A	E 335	Sodium tartrates	X		
A	E 336	Potassium tartrates	X		
A	E 341 (i)	Monocalcium-phosphate	X		Raising agent for self raising flour
A	E 400	Alginic acid	X	X	Milk-based products <sup>(1)</sup>

Authorisation	Code	Name	Preparation of foodstuffs of		Specific conditions
			plant origin	animal origin	
A	E 401	Sodium alginate	X	X	Milk-based products <sup>(1)</sup>
A	E 402	Potassium alginate	X	X	Milk-based products <sup>(1)</sup>
A	E 406	Agar	X	X	Milk-based and meat products <sup>(1)</sup>
A	E 407	Carrageenan	X	X	Milk-based products <sup>(1)</sup>
A	E 410*	Locust bean gum	X	X	
A	E 412*	Guar gum	X	X	
A	E 414*	Arabic gum	X	X	
A	E 415	Xanthan gum	X	X	
A	E 422	Glycerol	X		For plant extracts
A	E 440* <sup>(1)</sup>	Pectin	X	X	Milk-based products <sup>(1)</sup>
A	E 464	Hydroxypropyl methyl cellulose	X	X	Encapsulation material for capsules
A	E 500	Sodium carbonates	X	X	"Dulce de leche" <sup>(3)</sup> and soured-cream butter and sour milk cheese <sup>(1)</sup>
A	E 501	Potassium carbonates	X		
A	E 503	Ammonium carbonates	X		
A	E 504	Magnesium carbonates	X		
A	E 509	Calcium chloride		X	Milk coagulation
A	E 516	Calcium sulphate	X		Carrier
A	E 524	Sodium hydroxide	X		Surface treatment of "Laugengebäck"
A	E 551	Silicon dioxide	X		Anti-caking agent for herbs and spices
A	E 553b	Talc	X	X	Coating agent for meat products

Authorisation	Code	Name	Preparation of foodstuffs of		Specific conditions
			plant origin	animal origin	
A	E 938	Argon	X	X	
A	E 939	Helium	X	X	
A	E 941	Nitrogen	X	X	
A	E 948	Oxygen	X	X	

(1) The restriction concerns only animal products.

(2) This additive can only be used, if it has been demonstrated to the satisfaction of the competent authority that no technological alternative, giving the same guarantees and/or allowing to maintain the specific features of the product, is available.

(3) "Dulce de leche" or "Confiture de lait" refers to a soft, luscious, brown cream, made of sweetened, thickened milk

**SECTION B — PROCESSING AIDS AND OTHER PRODUCTS, WHICH MAY BE USED FOR  
PROCESSING OF INGREDIENTS OF AGRICULTURAL ORIGIN FROM ORGANIC PRODUCTION**

A: authorised under Regulation (EEC) No 2092/91 and carried over by Article 21(2) of Regulation (EC) No 834/2007

B: authorised under Regulation (EC) No 834/2007

Authorisation	Name	Preparation of foodstuffs of plant origin	Preparation of foodstuffs of animal origin	Specific conditions
A	Water	X	X	Drinking water within the meaning of Council Directive 98/83/EC
A	Calcium chloride	X		Coagulation agent
A	Calcium carbonate	X		
	Calcium hydroxide	X		
A	Calcium sulphate	X		Coagulation agent
A	Magnesium chloride (or nigari)	X		Coagulation agent
A	Potassium carbonate	X		Drying of grapes
A	Sodium carbonate	X		Sugar(s) production
A	Lactic acid		X	For the regulation of the pH of the brine bath in cheese production <sup>(1)</sup>
A	Citric acid	X	X	For the regulation of the pH of the brine bath in cheese production <sup>(1)</sup> Oil production and hydrolysis of starch <sup>(2)</sup>
A	Sodium hydroxide	X		Sugar(s) production Oil production from rape seed ( <i>Brassica</i> spp)
A	Sulphuric acid	X	X	Gelatine production <sup>(1)</sup> Sugar(s) production <sup>(2)</sup>
A	Hydrochloric acid		X	Gelatine production For the regulation of the pH of the brine bath in the processing of Gouda-, Edam and Maasdammer cheeses, Boerenkaas, Friese and Leidse Nagelkaas
A	Ammonium hydroxide		X	Gelatine production
A	Hydrogen peroxide		X	Gelatine production
A	Carbon dioxide	X	X	

Authorisation	Name	Preparation of foodstuffs of plant origin	Preparation of foodstuffs of animal origin	Specific conditions
A	Nitrogen	X	X	
A	Ethanol	X	X	Solvent
A	Tannic acid	X		Filtration aid
A				
A	Egg white albumen	X		
A	Casein	X		
A	Gelatin	X		
A	Isinglass	X		
A	Vegetable oils	X	X	Greasing, releasing or anti-foaming agent
A	Silicon dioxide gel or colloidal solution	X		
A	Activated carbon	X		
A	Talc	X		In compliance with the specific purity criteria for food additive E 553b
A	Bentonite	X	X	Sticking agent for mead <sup>(1)</sup> In compliance with the specific purity criteria for food additive E 558
A	Kaolin	X	X	Propolis <sup>(1)</sup> In compliance with the specific purity criteria for food additive E 559
A	Cellulose	X	X	Gelatine production <sup>(1)</sup>
A	Diatomaceous earth	X	X	Gelatine production <sup>(1)</sup>
A	Perlite	X	X	Gelatine production <sup>(1)</sup>
A	Hazelnut shells	X		
A	Rice meal	X		
A	Beeswax	X		Releasing agent
A	Carnauba wax	X		Releasing agent

(1) the restriction concerns only animal products

(2) the restriction concerns only plant products



## Annex II. Soil Association: information on processing

**More about substances of non-agricultural origin for consumers.**

**Source: Website Soil Association<sup>43</sup>**

It is worth remembering that organic food comprises about 1% of the entire food market. Some ingredients from animals and plants are not yet available in organic form. As a result the EU has compiled a list of products that fall into this category.

The Soil Association rules allow licensees to use these ingredients in non-organic form, but only up to a maximum of 5% (by weight) of the final product. Declarations that the ingredients are not produced from GM sources are obtained for all non-organic ingredients.

### **Additives**

Additives are added to food to alter its characteristics. Apart from baby food regulations, organic standards are the only regulations which restrict additives in food. Our standards cut out harmful additives.

### **Processing aids**

These are added to help process the food, for example a raising agent in breadmaking. But are not present in the final product.

### **Water**

Any water used as an ingredient, for rinsing equipment or for washing produce, must be fit for drinking. Our licensees must tell us:

- Where the water comes from
- How the water is treated and what is added to it

### **Salt**

Salt can be used in organic products, however it can only contain an anti-caking agent (stops particles clumping together) with our permission and providing that the licensee can justify to us why it is necessary.

### **Micro-organisms**

Micro-organisms such as yeast are allowed when used for baking and brewing. As well as lactic starter cultures for yoghurt and cheese. Enzymes, such as chymosin (rennet), are allowed in cheese making. Micro-organisms can be added to organic products provided that:

- They are normally used in food production
- They are not genetically modified
- They are preferably, grown on organic substrates
- In the case of enzymes, are not made by GMOs

### **Vitamins and minerals**

Vitamins, minerals and trace elements can only be used in organic products if the law requires them to be used. We believe that good health is based on having a diet largely made up of minimally processed wholefoods.

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<sup>43</sup><http://92.52.112.178/web/sa/saweb.nsf/ed0930aa86103d8380256aa70054918d/57b1100a1cfecad8025732b00338578?OpenDocument>

We oppose food policies that accept the routine removal and reduction in the quality of nutrients, through processing, and then encourage the replacement of a few of the missing elements by 'fortification' with synthetic versions. We are pressing the Food Standards Agency (FSA) to adopt a programme to address those food production factors that have reduced the level of key nutrients in many people's diets.

The Soil Association has opposed the proposal from the Food Standards Agency advisory committee to mandatorily fortify all flour with folic acid, arguing in favour of an alternative option to improve dietary education.

The Soil Association believes good health is founded on having a diet predominantly composed of minimally processed wholefoods. We cannot support food policies that accept the routine removal and degradation of nutrients by refining and other processing as normal, and then encourage the replacement of a few of the missing elements by 'fortification' with synthetic versions.

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### **Short description of additives**

Source: Website Soil Association – information for consumers<sup>44</sup>

#### **E160 (b) Annatto**

Vegetable dye extracted from the *Bixa orellana* (Annatto) tree. Allowed to be used (and required by law) only in traditionally coloured cheeses such as Double Gloucester and Red Leicester.

#### **E170 Calcium carbonate**

Natural chalk. Used as a carrier for other substances; to neutralise acids and to prevent sticking together of, for example, dried fruits. Calcium carbonate is required by the Flour Regulations so it must be added. Its function in that case is both as a carrier for the other vitamins and to add calcium. It is not allowed to be used for colouring.

#### **E220 Sulphur dioxide**

Preservative and anti-oxidant. Allowed only for use in wine and cider, to reduce infection and to prevent oxidation. Levels allowed are far less than those used in non-organic alcoholic drink production.

#### **E250 Sodium nitrite**

Derived from Sodium nitrate (Chilean saltpetre). Sodium nitrite has been used for decades to preserve meats, poultry and fish. Under organic standards it is only allowed to be used in the curing of bacon and ham.

#### **E251**

Not permitted

#### **E252 Potassium nitrate**

Mined mineral, Saltpetre or Chilean saltpetre. Only allowed to be used in the curing of bacon and ham, reduces to nitrite, which is the active ingredient in the curing process.

Note - Curing of meat controls the growth of harmful bacteria that can cause serious illnesses and therefore improves the safety of food. It especially protects against 'Clostridium botulinum', a microorganism that can cause one of the deadliest food-borne diseases: Botulism. Since the routine use of sodium nitrite by meat processors, no cases of Botulism have been associated with cured meats.

#### **E270 Lactic acid**

Naturally occurring from lactic bacteria. Lactic acid is used as an acidity regulator and preservative. It is produced from whey, corn starch, potatoes and molasses. May be found in infant formula, salad dressings, confectionery, soft drinks and tartare sauce.

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<sup>44</sup><http://92.52.112.178/web/sa/saweb.nsf/ed0930aa86103d8380256aa70054918d/62d2ffb33a96dc308025732b00415d76?OpenDocument>

**E290 Carbon dioxide**

Natural gas. Carbon dioxide is used to produce carbonated soft drinks and soda water. Traditionally, the carbonation in beer and sparkling wine comes about through natural fermentation, but some manufacturers carbonate these drinks artificially. Liquid carbon dioxide can be used to remove the caffeine content from coffee beans.

**E296 Malic acid**

Occurs naturally in apples. Malic acid is a tart-tasting acid that plays a role in many sour or tart foods. Apples contain malic acid, which contributes to the sourness of a green apple. Malic acid can make a wine taste tart, although the amount decreases with increasing fruit ripeness. Used to increase acidity in cider (where low acidity apple varieties are used) and as a preservative.

**E300 Ascorbic acid**

Vitamin C. Ascorbic acid is a water-soluble vitamin with antioxidant properties. Therefore, they have a role in the prevention of diseases attributed to oxidation and the activity of free radicals. Ascorbic acid and its sodium, potassium, and calcium salts are commonly used as antioxidant food additives and as flour improvers. It cannot be made by the body.

**E306 Tocopherol**

Vitamin E (only from natural concentrate, for example: wheat germ or soya bean oil). Only allowed to be used as an antioxidant in fats and oils (for example: in margarine), to prevent them going rancid.

**E322 Lecithin**

Lecithin is used for anything requiring a natural emulsifier (blender) and/or lubricant. For example, lecithin is the emulsifier that keeps cocoa butter in a chocolate bar from separating (a process known as blooming). A major source of lecithin is soya bean oil. Due to the EU requirement to declare the addition of allergens in foods a gradual shift to other sources of lecithin, for example: from sunflower oil, is taking place. Lecithin is an integral part of cell membranes, and can be totally digested so it is virtually non-toxic to humans. Other emulsifiers can only be excreted via the kidneys.

**E330, E333 Citric acid, Calcium citrate**

Citric acid is a weak acid found in citrus fruits. It is a good, natural preservative and is also used to add a (sour) taste to foods and soft drinks, and acts as an antioxidant. As a food additive, citric acid is used as a flavouring and preservative in food and beverages, especially soft drinks. Citric acid can also be added to ice cream to keep fat globules separate. It is naturally present in almost all forms of life, and excess citric acid is readily digested and eliminated from the body. Organic lemon juice can be used to replace citric or ascorbic acid. Calcium citrate is the calcium salt of citric acid. It is usually used as a preservative, but sometimes for flavour. Calcium citrate has a sour and salty taste, and can be found in confectionery, jellies and jams.

**E334, E335 Tartaric acid (L+)-, Sodium tartrate**

Tartaric acid occurs naturally in many plants, particularly grapes and tamarinds, and is one of the main acids found in wine. It is added to other foods to give a sour taste, and is used as an antioxidant, preservative and acidity regulator. In wine making, tartaric acid plays an important role chemically, lowering the pH of fermenting 'must' to a level where many undesirable spoilage bacteria cannot live: and acts as a preservative after fermentation. Sodium tartrate is used as an emulsifier and a binding agent in food products such as jellies, margarine, and sausage casings.

**E336 Potassium tartrate**

Cream of Tartar. Used as a raising agent for flour. This is the potassium salt of tartaric acid (E334).

**E341(a) Monocalcium phosphate**

Only allowed to be used as a raising agent in self-raising flours.

**E406 Agar**

Derived from seaweed. Used as a thickening and gelling agent. Often used as a vegetarian gelatin substitute — a thickener for soups, in jellies, ice cream and as a clarifying agent in brewing.

**E407 Carrageenan**

'Irish Moss' derived from seaweed. Used as a stabiliser, thickening and gelling agent. Only 'undegraded' carrageenan is allowed for food use, which is NOT carcinogenic. They can be used in: desserts, ice cream, milk shakes, sauces - to thicken, beer – clarifier; toothpaste - stabilizer to prevent constituents separating; shampoo and cosmetic creams - thickener.

**E410 Locust bean gum (Carob)**

Locust bean gum is a vegetable gum extracted from the seeds of the Carob tree. It forms a food reserve for the seeds and helps to retain water under arid conditions. It is used as a thickener and gelling agent. It is also called Carob Gum or Carubin.

**E412 Guar gum (Cluster bean)**

Guar gum, a natural gum, is an edible thickening agent extracted from the guar bean. Often used as thickener in toothpastes, conditioner in shampoos, and binder in tablets. It is also consumed as a dietary fibre.

**E414 Arabic gum (Acacia)**

A natural gum also called gum acacia. It is used primarily in the food industry as a stabiliser (a substance added to a product to give it body and to maintain a desired texture).

**E415 Xanthan gum**

Xanthan gum is a natural gum. It is most often found in salad dressings and sauces. It helps to stabilise the colloidal oil and solid materials found in these products. It is also used in frozen foods and beverages. Toothpaste often contains Xanthan where it serves as a binder to keep the product uniform.

**E422 Glycerol**

Glycerol, also well known as glycerin and glycerine, is a colourless, odourless, sweet-tasting liquid. Serves as: humectant (a substance that helps retain moisture) and softening agent in confectionery, cakes and casings for meats and cheeses; a solvent - capable of dissolving or dispersing one or more other substances or flavours, such as vanilla. It is also used as a sweetener and may help preserve foods.

**E440(i) Pectin**

Extracted from the pith of citrus fruits. Only non-amidated pectin is permitted. Pectin is derived from the cell wall of plants. Under acidic conditions, pectin forms a gel, and it can be used as an edible thickening agent in processed foods. Often found in jams and jellies.

**E500, E501 Sodium/Potassium carbonates**

Includes Bicarbonate of soda. Used as a raising agent in flour. Also used in the processing of sugar. It has a cooling alkaline taste, and can be extracted from the ashes of many plants. Sodium and potassium carbonates are acidity regulators, anticaking agents, raising agents and stabilisers.

**E503 Ammonium carbonate**

Used as a raising agent in flour and baked products. A white salt, soluble in water (insoluble in alcohol), which forms a strongly alkaline solution. It is also known as 'baker's ammonia' and was a forerunner to the more modern leavening agents - baking soda and baking powder.

**E516 Calcium sulphate**

Gypsum. Allowed only as a carrier, for example: for the minerals and vitamins that are required by law in white flour, or as a coagulation agent, for example: in tofu.

**E524 Sodium hydroxide**

Caustic soda. Allowed to be used only on 'haugengebäck' (a traditional German pastry), and in oil processing.

**E551 Silicon dioxide**

Used as an anti-caking agent in herbs and spices.

**E941 Nitrogen**

Natural gas. Used in modified atmosphere packaging.

**E948 OXygen**

Natural gas. Used in modified atmosphere packaging.

**E938 Argon**

Natural inert gas. Used in modified atmosphere packaging.

**Sodium chloride or potassium chloride**

Natural salt. Used widely as a flavour enhancer and preservative. A flowing agent may be used where it can be proved necessary to ensure even application in the manufacturing process.

Following the revision of the additives lists in the EU regulation (primarily to include those for meat and dairy products) which includes a total of eight new additives, we are proposing to add four more additives in our standards. Three of these are variants of additives we already allow but, as they have different E numbers, they have to be listed separately. They are:

- sodium ascorbate (a variant of ascorbic acid – vitamin C) that helps to reduce the nitrate/nitrite levels needed for curing meat products.
- sodium lactate (a variant of lactic acid, the acid in yoghurt)
- sodium citrate (a variant of citric acid, the acid in citrus fruits).

The fourth new additive is Hydroxy-propyl-methyl-cellulose. It's what vegetarian capsules are made from and it can **only** be used for this specific purpose.

## Short description of processing aids

From Soil Association Website – information for consumers<sup>45</sup>

Processing aids are added to help process the food but are not present in the final product. The processing aids listed below can be used, but only in line with the specific conditions listed underneath them:

### Water

#### Calcium chloride

Coagulation agent

#### Calcium carbonate

Used as a carrier for things like vitamins, enzymes or additives such as raising agents

#### Calcium sulphate

Coagulation agent

#### Calcium hydroXide

Only allowed for treating maize flour to make tortilla chips and sugar production

#### Magnesium chloride (or nigari)

Coagulation agent

#### Potassium carbonate

Drying grapes

#### Carbon dioxide

Gas used to alter the levels of oxygen in packaging and prevent food spoiling

#### Nitrogen

Gas used to alter the levels of oxygen in packaging and prevent food spoiling

#### Ethanol

Natural alcohol. Used as a solvent for herbs, spices and other products to extract and concentrate essential oils, tinctures, flavours, etc.

#### Tannic acid

Naturally derived filtration aid

#### Egg white albumen

Naturally derived filtration aid

#### Casein

Naturally derived filtration aid

#### Gelatin

Naturally derived filtration aid

#### Isinglass

Naturally derived filtration aid

#### Vegetable oils

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<sup>45</sup><http://92.52.112.178/web/sa/saweb.nsf/ed0930aa86103d8380256aa70054918d/a4f04130d67c25cf8025732b0048e168?OpenDocument>

Non-hydrogenated oils only. Used for greasing baking tins and other moulds and as a releasing agent (to assist the release of food products from moulds). May also be used as anti-foaming agents.

**Silicon dioxide gel or colloidal solution**

Naturally derived filtration aid

**Activated carbon**

Naturally derived filtration aid

**Bentonite**

Naturally derived filtration aid

**Diatomaceous earth**

Naturally derived filtration aid

**Perlite**

Naturally derived filtration aid

**Hazelnut shells**

Naturally derived filtration aid

**Beeswax**

Natural beeswax. Used as a releasing agent (to assist the release of food products from moulds)

**Carnauba wax**

Only allowed to be used as a releasing agent

**Sodium carbonate**

Sugar production

**Sodium hydroxide**

Sugar production

**Sulphuric acid**

Sugar production

**Citric acid**

Oil production and hydrolysis of starch

**Rice meal**

Used to reduce sticking on baking trays, etc.