

Risklist of possible GMO products 040421

| Group | Product | Possible GMO origin | | | | | | | |
|-------|----------------------------|---------------------------|------------|-----------|------------------|----------------|------------------|---------------|-----------|
| | | | Seeds G | Food F | Feedstuffs FS | Additives A | Proc./Prod. P | Miscell. M | |
| 1 | Cotton seed | Cotton | S | | FS | | | | |
| 1 | Cotton seed oil | Cotton | | F | FS | | | | |
| 1 | Cotton fiber | Cotton | | | | | | | M |
| 2 | Fodder beets | Fodder beets | S | | FS | | | | |
| 3 | Vitamin B 12 | GMMO | | | | A | | | |
| 6 | Yeast, "released" | GMMO | | F | FS | | | | |
| 3 | Yeast, "enclosed" | GMMO | | F | FS | | P | | |
| 1 | Maize, maize kernels | Maize | S | F | FS | | | | |
| 1 | Cornflour | Maize | | F | FS | | | | |
| 1 | Maize oil | Maize | | F | FS | | P | | |
| 1 | Maize protein | Maize | | F | FS | | | | |
| 1 | Maize sprouts | Maize | | F | FS | | | | |
| 1 | Maize gluten (protein) | Maize | | F | FS | | | | |
| 1 | Maize fiber | Maize | | F | FS | | | | |
| 1 | HVP, protein | Maize | | F | FS | | | | |
| 1 | Xylose | Maize | | F | | | | | |
| 1 | Corn starch | Maize | | F | FS | | P | | |
| 1 | Malto dextrin | Maize | | F | FS | | | | |
| 1 | Starch sirap (glucose) | Maize | | F | | | | | |
| 1 | Glucose (starch syrup) | Maize | | F | | | | | |
| 1 | Fructose syrup | Maize | | F | | | | | |
| 1 | Fructose (fruit sugar) | Maize | | F | | | | | |
| 1 | Glucose (grape sugar) | Maize | | F | | | | | |
| 1 | Grape sugar (glucose) | Maize | | F | | | | | |
| 1 | Maltose (malt sugar) | Maize | | F | | | | | |
| 1 | Ethanol (alcohol) | Maize | | F | FS | | P | M | |
| 1 | Corn flakes | Maize | | F | | | | | |
| 1 | Popcorn maize | Maize | | F | | | | | |
| 1 | Starch | Maize | | F | FS | | P | | |
| 1 | Emulsifiers | Maize | | | | A | | | E470-E495 |
| 1 | Fibers | Maize, soya, cotton, rape | | F | FS | | | M | |
| 2 | Potato starch | Potato | | F | FS | | | | |
| 2 | Amylopectin starch | Potato | | | | A | | | |
| 2 | Potato | Potato | S | F | FS | | | | |
| 1 | Rape seed | Rape | S | | | | | | |
| 2 | Rape cake | Rape | | | FS | | | | |
| 2 | Rape oil | Rape | | F | FS | | P | | |
| 2 | Sugar | Sugar | | F | | | | | |
| 2 | Sugar beets | Sugar beets | | F | FS | | | | |
| 2 | Molasses | Sugar beets | | | FS | | | M | |
| 3 | Acetic acid | GMMO | | | | A | | | |
| 1 | Soybeans | Soya | S | F | FS | | | | |
| 1 | Soybean shells | Soya | | | FS | | | | |
| 1 | Soya flakes | Soya | | F | FS | | | | |
| 1 | Soya lecithin | Soya | | | | A | | | E 322 |
| 1 | Lecithin | Soya | | | | A | | | E 322 |
| 1 | Soya protein | Soya | | F | FS | | | | |
| 1 | Soya flour | Soya | | F | FS | | | | |
| 1 | Soya concentrate | Soya | | F | FS | | | | |
| 1 | Soya isolate (90% protein) | Soya | | F | FS | | | | |

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|---|---------------------------------|---------------|---|---|----|----|--|---|--------|
| 1 | Soya fiber | Soya | | F | FS | | | | |
| 1 | Soy oil | Soya | | F | FS | P | | | |
| 2 | Tomato | Tomato | S | F | FS | | | | |
| 2 | Tomato purée | Tomato | | F | | | | | |
| 1 | Rose lettuce, rossi lettuce | Rossi lettuce | S | F | | | | | |
| 3 | Vitamins | GMMO | | | | | | P | |
| 3 | Enzymes | GMMO | | F | FS | A | | P | |
| 3 | Amylase | GMMO | | F | FS | A | | P | enzyme |
| 3 | Protease | GMMO | | F | FS | A | | P | enzyme |
| 3 | Chymosin (rennet) | GMMO | | F | FS | A | | P | enzyme |
| 3 | Rennet | GMMO | | F | FS | A | | P | enzyme |
| 3 | Lactic acid culture | GMMO | | F | FS | | | | |
| 3 | Mould culture | GMMO | | F | | | | | |
| 3 | Butyric acid culture | GMMO | | F | | | | | |
| 3 | Lactic acid | GMMO | | | | | | P | E 270 |
| 3 | Askorbic acid (vitamin C) | Maize, GMMO | | | | | | P | E 300 |
| 3 | Tartaric acid | GMMO | | | | | | P | E 334 |
| 3 | Calcium citrate | GMMO | | | | | | P | E 333 |
| 3 | Sodium tartrate | GMMO | | | | | | P | E 335 |
| 3 | Potassium tartrate | GMMO | | | | | | P | E 336 |
| 3 | Sodium alginate | GMMO | | | | | | P | E 401 |
| 3 | Xanthan gum | GMMO | | | | | | P | E 415 |
| 3 | Flavourings | GMMO | | F | FS | | | | |
| 3 | Microorganisms | GMMO | | F | FS | | | M | |
| 3 | Vitamin A (carotenes) | GMMO | | | | | | P | E 160 |
| 3 | Vitamin D | GMMO | | | | | | P | |
| 3 | Tocopherol (Vitamin E) | Soya beans | | | | | | P | E 306 |
| 3 | Pectinase | GMMO | | F | FS | A | | P | enzyme |
| 2 | Rice | Rice | S | F | FS | | | | |
| 2 | Rice starch | Rice | | F | FS | | | | |
| 2 | Papaya | Papaya | S | F | FS | | | | |
| 2 | Peanut | Peanut | S | F | FS | | | | |
| 2 | Peanut oil | Peanut | | F | FS | | | | |
| 2 | Sun flower oil | Sun flower | | F | FS | | | | |
| 2 | Solros | Solros | S | | FS | | | | |
| 2 | Squash | Squash | S | F | FS | | | | |
| 4 | Farmyard manue | | | | | | | | M |
| 4 | Green fertilizer | | | | | | | | M |
| 6 | Algae and seaweed | | | | | | | | M |
| 6 | Biological pesticides | | | | | | | | M |
| 2 | Soaps, saponified fatty acids | Oil | | | | | | | M |
| 3 | Acetic acid (from fermentation) | GMMO | | F | FS | A | | | |
| 3 | Sodium bensoate | GMMO | | | | A | | | E211 |
| 3 | Propylparabensoate | GMMO | | | | | | P | |
| 3 | Bacterial compound | GMMO | | F | FS | | | P | |
| 3 | Antioxidants (fish feed) | GMMO | | | | A | | | |
| 3 | Colourings (fish feed) | GMMO | | | | A | | | |
| 3 | Drugs (fish) | GMMO | | | | | | | M |
| 3 | Vaccines | GMMO | | | | | | | M |
| 3 | Veterinary compounds | GMMO | | | | | | | M |
| 3 | Natural medicines | | | | | | | | M |
| 2 | Potato protein | Potato | | | | FS | | | |
| 6 | Palm expeller | | | | | FS | | | |
| 2 | Beet pellets | Beets | | | | FS | | | |
| 2 | Beet fiber | Beets | | | | FS | | | |

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|---|--------------------------|-----------------|-----|----|
| 2 | Druff, distiller's waste | Maize etc. GMMO | | FS |
| 2 | Lime-based grease | Oils | | FS |
| 2 | Protamyl, potato protein | Potato | | FS |
| 6 | Fish meal | Fish | | FS |
| 2 | Fodder fat | Oils | | FS |
| 2 | Betaine | Sugar beets | | FS |
| 3 | Glutamate | GMMO | | A |
| 2 | Melon | Melon | S F | FS |

GMO products – How these shall be inspected (unabridged version 21 April 2004)

The description of how GMO risks shall be handled is divided into six main groups.

Group 1: High risk for GMO involvement, products produced from plants

Group 2: Lower risk GMO involvement, products produced from plants

Group 3: Products that be produced from genetically-modified microorganisms, GMMO

Group 4: Products from animals that have received GMO fodder/fertilizer/compost

Group 5. Medications

Group 6: Products that were illegal to market in the form of GMO and where the risk for unintentional mixing is small.

A risk list of products with possible GMO origin gives examples of which products can be found in which groups. The text below indicates how each group shall be inspected and which certificate is required for certification.

1. Products produced from plants where the risk for GMO involvement is high

Inspection:

Highest risk level: Every delivery of products from Group 1 must be accompanied by the current certificate that no GMOs were used for that batch. A current certificate must be able to be produced for the inspector. As an alternative to this, the company purchasing the products can take samples in its own inspection and perform GMO analyses to a sufficient extent. The inspector shall be allowed to review the analysis protocol and this shall be clearly linked to the actual batch.

Background:

Crop farming of GMOs in Group 1 is extensive and the danger of GMO involvement is high in all steps in the handling process. At this point (19 March 2004) these include soya and maize, as well as cotton. The situation for rape is that it is not grown within the EU and that the import of rape oil from countries outside of the EU is limited.

Businesses not purchasing raw material but rather composite products using raw materials, must have a certificate (for example, a discharge from liability) from the company that purchases raw materials stating that they have routines for GMO inspection that are equivalent to those described here. (That is, a business that purchases a spice mixes in which maize starch is used does not need a document for every batch, but they must ensure that the company producing the spice mix has such a certificate).

GMO certificate (or, a GMO-free certificate)

When certifying a product, it must be decided which type of certificate that must be accessible during the inspection. A certificate that GMO is not used and that sufficient measures have been taken so that unintentional mixing cannot occur can take different forms. To guarantee GMO free is impossible and therefore it is incorrect to call the document a GMO-free certificate. But, for lack of another simple way to name the certificate, it can be called this. Certificates can be of two different types: third-party certificate or the company's own.

Third-party certificate, that is, a certificate from a separate inspection organization, is preferable if the third party is a recognized inspection organization. The third-party inspections that KRAV accepts without additional requirements for documentation are the

IFOAM-accredited inspections. The other organic inspections carried out by the organizations that are on KRAV's A-list, shall conduct the GMO inspection in the actual program in the same way as they do for the IFOAM-accredited program. For organizations on the C-list, it shall be evident from the latest inspection report that a GMO inspection has been conducted as described below.

For other third-party inspection organizations, it is required that they can show that they carry out inspections according to criteria equivalent to that described below for a company certificate.

Company certificate

Businesses can corroborate that they have created a system to avoid any involvement with GMO. Such a system is often called an IP system (identity preservation). If lacking a third-party inspection, the company must be able to give an account of how the IP system is designed to ensure sufficient safeguards. In principle, there are two possibilities:

1. The IP system is designed so that the GMO analyses are carried out at the critical inspection points to ensure that mixing does not occur.
2. The IP system is built on growing under contract within an area where all the growers pledge not to grow GMO and who are geographically separated from other possible GMO farming so effectively that there is no possibility of spreading. Even such a system must be verified with GMO analyses, but these do not need to be as extensive. The geographical area may not solely be a country where a certain GMO is not permitted or a declared "GMO-free" zone but requires that there are routines that show active commitment from the growers in the area.

After the last critical inspection point, it must be able to be shown that separate handling in the continued chain of custody is possible to maintain, that is, that the batch is packed and labelled in such a way that it will arrive at the destination ensuring that no involvement or mixing with other risk products can occur.

Analyses and sampling

Screening for GMO using PCR analysis is the usual routine step. Parameters that must be inspected are:

- that screening is carried out for all known GMO. For maize, this has been possible so far by screening for the gene fragments 35S and NOS. Both of these must be included in the screening. For soya, the analyses are often specifically designed for RR soya, which for the present is acceptable, but even here screening is recommended at an inspection point. For rape there is an additional gene fragment that must be included in the screening.
- that the method is sufficiently sensitive KRAV requires a reporting threshold of 0.1% for soya and maize when samples are taken from raw materials with intact DNA. Samples from products with broken-down DNA, such as thermotreated products, do not constitute an adequate test of an IP system, but must instead be preceded by samples in earlier steps in production.
- that false negative results are not permitted, by testing the method of analysis against the GMO standards that are added to the same matrix (in a specific product, there can be substances that destroy the analysis, inhibitors, and these must be removed during sample preparation).
- that sufficient samples are taken during sampling. This is of vital importance. With a lack of established standards for this (for example, from CEN) it can only be stated

that partial samples must be taken out of the total batch that shall be tested in a representative manner.

- If using other methods (such as a "kit") these shall have been tested for the actual sample type in such a manner that gives sufficient security. A possibility is to use a "kit" for most of the inspection points in the IP system but to plan for a PCR analysis at one of the later steps.

Illegal products from high-risk crops

The specific genetically-modified crops that are approved to grow or use in food and feeds within the EU are listed on the EU Commission's website.

http://europa.eu.int/comm/food/food/biotechnology/gmfood/index_en.htm

Other genetic modifications of soya and maize that solely exist in field trials or are approved outside of the EU may not be present in deliveries to the EU. This means that countries outside of the EU that deliver conventional soy beans or maize in bulk, with a certain mixing of GMOs, must still keep the product separate from such GMOs that are not permitted with the EU.

For KRAV certification, this means that the described IP system above must be complemented with the GMO screening that is carried out as possible must also be able to detect the banned GMO. This can mean that the PCR analysis screening requirement to include gene fragments 35S and NOS, shall be complemented with the gene fragments that are screened for with separate handling against the other GMOs permitted in the actual country.

2. Products produced from plants where the risk for GMO involvement is lower

Inspection:

Group 2: A document is not needed for every delivery, as it is enough that there is a current product sheet or certificate that states that the ingredients are not produced from GMO. The company should make certain that the product sheet/certificate is updated at least once a year. During the inspection, it must be shown that the receiving goods routines guarantee that is the correct product that is delivered.

Background:

Group 2 includes products produced from crops where there is permitted GMO outside of the EU but commercial growing is not permitted within the EU (the latest update on this information was 19 March 2004). The risks for GMO involvement are therefore judged to be lower. Examples are products produced from rape, potatoes, sugar beets, tomatoes, etc. Most of the important raw materials in these products are available as KRAV-certified or organic and therefore these ingredients shall be used. For other conventional ingredients, it shall be evident from the product sheet or other document that the suppliers do not use GMO raw materials, as well as it is indicated that the raw materials are not purchased from countries where the equivalent GMO varieties are permitted. Products imported from the USA, Canada, Mexico, Argentina or China for example require current certificates for every batch, i.e. they shall be treated as Group 1.

The judgment is that within the EU (including the new member states) these GMOs are only being farmed experimentally and therefore, it is enough with a general production sheet or document that show that the supplier is observant of GMO products and has the intention to avoid delivering GMO products if they were to be available on the market.

Example: A spice mix contains tomato powder. The product information sheet shall indicate that it is not produced from GMO tomatoes. The information shall ensure that the raw material does not come from any country where GMO tomatoes are permitted.

For a list of countries outside the EU where these GMOs are permitted see, <http://www1.oecd.org/ehs/biobin/>.

3. Products produced from GMOs in closed production (i.e. from genetically-modified microorganisms such as bacteria and fungi)

Inspection:

A current product sheet or other certificate (for example, a discharge from liability) indicating that GMOs are not used in making the products in Group 3 shall be furnished by the producer who shall have quality assurance routines.

Background:

A number of products may contain or be produced from genetically-modified microorganisms (GMMO). Examples are living cultures, such as lactic acid cultures or cheese moulds and different substances that are made from microorganisms. Enzymes are such substances but also other substances that are a part of the microorganism's metabolism and thus can be extracted from them or produced with their help, such as vitamins or other substances (such as the additive citric acid).

The substrate used for growing the microorganisms can also be made from GMO. This is equivalent to the situation for feed to animals. According to the "one-step-backwards" principle, KRAV inquires after information if the product is a living culture, but not if the product is produced from a microorganism.

Since 18 April 2004, companies are liable to declare all conventional food and feeds in the list of ingredients if the product is produced from GMO, which means that they must handle certificates for all ingredients they use, not only those that will be used in organic production. Where the application instructions from authorities are still missing, it is likely that it will be some time before the companies are able to follow this legislation that also is not in itself any guarantee regarding GMO that KRAV can accept. Exceptions to this labelling requirement are food additive carriers and solvents that make it imperative for KRAV to particularly follow-up on these substances during certification.

4. Products from animals that have received GMO fodder, fertilizer, compost

Inspection

For conventional products in Group 4, extra inspections are not currently proposed.

Background:

For conventional ingredients, the “one-step-backwards” means that no documentation regarding GMO is required for ingredients produced by animals. This means, for example, that gelatine does not require documentation that the animal has not eaten GMO fodder.

The exception to this is manure that comes from farms where animals to a greater degree eat GMO fodder. There is a certain danger that fodder lands directly in the manure (or that seeds pass through the animal without breaking down). The recommendation is to avoid such fertilizer or to compost it. A certificate that GMO is not used in fodder is requested when it is deemed necessary. As long as no GMO is grown in Sweden this will not be a big problem.

Compost is considered as “one step”, that is, a certificate may be needed that documents that living bacterial cultures composed of GMO are not composted (or plant wastes from GMO crops if these are later permitted), but KRAV does not require a certificate regarding the risks for unintentional mixing of GMO in a compost.

5. Medication

Animals shall have adequate medication and the ban against using products produced from GMO is thus not applicable. However, for vaccines there are products produced with GMOs and these shall be chosen according to Standard 5.4.5. Medications produced from GMO may only be used for fish when there are not effective alternatives, Standard 7.6.1.5.

6. Products that were illegal to market in the form of GMO and where the risk for unintentional mixing is small.

Inspection

For ingredients in Group 6 it is enough to inspect that the product is that certified by KRAV.

Background:

For banned products, it is not meaningful to require a certificate tied to the product. This applies to baker's yeast as an example. There is no reason to require a certificate stating that ordinary yeast is not genetically modified because it is one of the ingredients that must be approved according to EU's legislation first prior to use. This applies if the yeast is supplied by a company falling under authorities' normal inspections and can be said to have quality assurance routines.

On the other hand, GMO yeast that is used as a processing aid can be used if permission has been obtained for closed use and therefore a certificate should be requested when products from such processes are used.

Currently, there are no GMO animals permitted in the EU for anything other than use in closed trials. Neither are any biological pest control substances permitted. (Information from 21 April 2004, http://europa.eu.int/comm/food/food/biotechnology/gmfood/index_en.htm)

Support in the Standards

Standards regarding GMO are included in following sections in KRAV's Standards from July 2004:

2.9.5

2.12.11
3.1.6
4.3.1
4.3.7
4.4.2
4.6.4
5.1.15
5.3.3
5.4.5
6.1.3
6.1.9
7.4.3
7.5.1.4
7.5.2.2
7.6.1.5
9.1.5
9.2.2
12.1