



Oilseed cakes and meals: ensuring equivalent treatment for all oilseed cakes and meals under the EU Fertilising Products Regulation

Executive Summary

When vegetable oils are extracted from oilseeds, they leave behind cakes or meals that are used to produce food, feed and fertilising products. Oilseeds cakes/meals are a valuable source of organic nitrogen and carbon for organic-based fertilizers, contain other nutrients and may be used for their functional properties (solubility/emulsions, etc.).

While some oilseeds are cold-pressed, most are treated with solvents (usually hexane) to extract as much of the high-value oil from the seeds as possible. (See sections I and II for more information.)

Today, oilseed cakes, including those obtained through the use of solvents, are allowed to be used in fertilising products under national rules across the European Union, including in Austria, Belgium, France, Germany, Italy, Portugal and Spain. (See section III for more information.)

Because they are substances obtained from natural sources that have not been chemically modified and do not meet the criteria for classification as dangerous according to Directive 67/548/EEC, oilseed cakes/meals are exempted from REACH registration according to Paragraph 9 of Annex V of Regulation (EC) 1907/2006. The vegetable oils that are obtained through solvent-based extraction are explicitly listed in this paragraph. (See section IV for more information.)

However, none of the Component Materials Categories of the Regulation (EU) 2019/1009 [Fertilising Products] accommodates the use of oilseed cakes/meals obtained through solvent-based extraction as Component Materials in EU Fertilising Products. (See section V for more information.)

To remedy this, ECOFI suggests modifying CMC 2 as follows:

“An EU fertilising product may contain plants, plant parts or plant extracts having undergone no other processing than cutting, grinding, milling, sieving, sifting, centrifugation, pressing, drying, frost treatment, freeze-drying or extraction with water or supercritical CO₂ extraction. **Oilseed cakes or meals that were obtained through the use of solvents may also be incorporated in EU fertilising products if the component material is explicitly covered by the registration obligation exemption provided for by point 9 of Annex V to Regulation (EC) No 1907/2006.**”

(See section VI for more information.)

ECOFI also recommends modifying the labelling requirements in Annex III, Part I, Paragraph 5 of the Fertilising Products Regulation as follows:

“Where the EU fertilising product contains **any substance listed in Annex I of Directive 2002/32/EC on undesirable substances in animal feed in quantities higher than the Maximum Content indicated in that directive**, the following instruction shall be provided on the label: ‘Hazardous to animals in case of ingestion’.”

This will allow for a consistent and fair treatment of all oilseed cakes/meals. (See section VII for more information.)

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I. What are oilseed cakes and how are they produced?

High-value vegetable fats and oils are extracted from oilseeds. As well as being used as table oils, these fats and oils are also used in soaps, margarine, chocolate, pharmaceuticals, chemicals, lubricants, biofuels, and cosmetics, among others.

Extraction of vegetable oils is usually done through cold pressing or through the use of solvents (usually hexane). Because they are relatively expensive, solvents used during the extract process are recovered for re-use in subsequent extraction. Any solvent that remains in the cakes/meal is highly volatile and evaporates quickly – the boiling point of hexane, for example, 69 °C – thus, making it easy to extract from cakes, and meaning that the traces that remain in the cakes/meal are negligible. Consequently, many cakes/meal are used to produce food and feed.

Solvents are used because they greatly increase the proportion of the high-value oils and fats that can be extracted from the oilseeds. Cold pressing generally leaves 10-11% of the oils in the cakes/meal. A second cold pressing can reduce this to about 5%, but it is infrequent to conduct a second cold pressing because of an unfavourable cost:benefit ratio. Using solvents makes it possible to extract about 99% of the oil content.

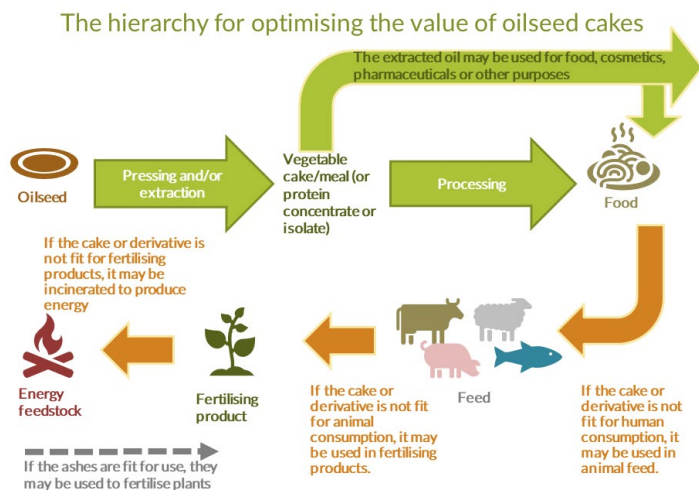
Commonly used oilseeds include soyabean (fabaceae seed), cocoa (sterculiaceae seed), peanut (fabaceae seed), rapeseed (brassicaceae seed), cotton (Malvaceae seed), olive (oleaceae fruit), castor (euphorbiaceae seed), sunflower (asteraceae seed), palm (arecaceae fruit); linseed or canola (linaceae seed); argan, macadamia, peach pits, nuts, hems, sesame seeds, and prickly pear seeds, etc.

When the oils are extracted, they leave behind cakes or meals that are rich in nitrogen (protein). In addition to their nitrogen content, oilseeds cakes/meals contain other nutrients and may be used for their functional properties (solubility/emulsions, etc.). Oil producers sell

these cakes and meals to downstream industries that convert them for use in food, feed and fertilising products. Proteins in cakes are concentrated (70% protein) or isolated (90% protein) to be used in food, in feed and sometimes in fertilisers. Oilseed cakes, concentrates and isolates of vegetable proteins can all be used as feedstock for protein hydrolysates, which being soluble and of low molecular weight, can be used in food and feed, and also in foliar fertilising products.

II. Oilseed cakes are used to produce food, feed and fertilising products, depending on their quality characteristics

Vegetable cakes and meal usually undergo a series of treatments that may include, concentration, isolation, hydrolysis, fermentation, and filtration among others as they are transformed into high-value food and feed proteins and/or fertilising products, although they may also be incorporated into organic-based fertilisers directly.



How oilseed cakes and meals are used depends, in part, on their inherent content of unwanted substances and how successfully those can be reduced through treatment processes. If the cakes / meals contain too many undesirable substances for food uses – whether naturally (including certain sugars that can't be assimilated) or incidentally (e.g. degradation through exposure to moisture or heating or the development of mould) they are then considered for use in animal

feed.

The maximum content of hexane allowed in animal feed and feed materials indicates how little solvent can be found in oilseed cakes/meals after oil extraction using solvents.

Undesirable substance	Products intended for animal feed	Maximum content in mg/kg (ppm) relative to a feed with a moisture content of 12 %
Hexachlorocyclohexane (HCH)		
– alpha-isomers	Feed materials and compound feed	0,02
	with the exception of:	
	– fats and oils.	0,2
– beta-isomers	Feed materials	0,01
	with the exception of:	
	– fats and oils.	0,1
	Compound feed	0,01
	with the exception of:	
	– compound feed for dairy cattle.	0,005
– gamma-isomers	Feed materials and compound feed	0,2
	with the exception of:	
	– fats and oils.	2,0

Source: Commission Regulation (EU) No 574/2011 amending Annex I to Directive 2002/32/EC on undesirable substances in animal feed

Only if oilseed cakes/meals do not meet the standards for animal feed, are they considered for use in fertilising products. Finally, if the cakes and meals are not considered fit even for use in fertilising products, they become raw materials for biofuels or energy production. In some cases the ashes from energy production can be recovered for use in fertilising products).

Detecting and removing unwanted substances from oilseed cakes and meals is a key area for innovation in the industry and allows for a growing proportion of oilcakes and meals to be revalorised within the Circular Economy instead of being discarded through landfill or incineration.

III. Why are oilseed cakes used in organic-based fertilisers?

As mentioned above, oilseed cakes and meals contain nutrients and organic carbon and are particularly rich in nitrogen (protein). That makes them a valuable source of organic carbon and nitrogen for organic-based fertilisers. It also means that they used as raw materials to produce plant-based hydrolysed proteins, which are used in organic-based fertilisers and plant biostimulants. Such plant-based hydrolysed proteins are under increasing demand from organic farming and the organic food chain, which is increasingly choosing to produce vegan-friendly products.

In addition to their use in organic-based fertilisers, hydrolysed proteins may be used for their biostimulant properties.

Today, oilseed cakes, including those obtained through the use of solvents, are allowed to be used in fertilising products under national rules across the European Union. For example, Austria, Belgium, France, Germany, Italy, Portugal and Spain all allow oilseed cakes and meals to be incorporated into organic fertilisers, even if they have been obtained by extracting oils with solvents.

IV. Oilseed cakes and meals are exempted from registration under Regulation (EC) 1907/2006 (REACH)

According to the definitions excerpted from the REACH regulation below, oilseeds are substances that occur in nature and are not chemically modified, despite being chemically treated with solvents to obtain oils and oilseed cakes and meals,.

Paragraph 40 of Article 3 of Regulation (EC) 1907/2006

40. not chemically modified substance: means a substance whose chemical structure remains unchanged, even if it has undergone a chemical process or treatment, or a physical mineralogical transformation, for instance to remove impurities;

Paragraph 8 of Annex V of Regulation (EC) 1907/2006

8. Substances which occur in nature other than those listed under paragraph 7, if they are not chemically modified, unless they meet the criteria for classification as dangerous according to ► M3 Regulation (EC) No 1272/2008 ◀ or unless they are persistent, bioaccumulative and toxic or very persistent and very bioaccumulative in accordance with the criteria set out in Annex XIII or unless they were identified in

accordance with Article 59(1) at least two years previously as substances giving rise to an equivalent level of concern as set out in Article 57(f).

Paragraph 9 of Annex V of Regulation (EC) 1907/2006

9. The following substances obtained from natural sources, if they are not chemically modified, unless they meet the criteria for classification as dangerous according to Directive 67/548/EEC with the exception of those only classified as flammable [R10], as a skin irritant [R38] or as an eye irritant [R36] or unless they are persistent, bioaccumulative and toxic or very persistent and very bioaccumulative in accordance with the criteria set out in Annex XIII or unless they were identified in accordance with Article 59(1) at least two years previously as substances giving rise to an equivalent level of concern as set out in Article 57(f):

Vegetable fats, vegetable oils, vegetable waxes; animal fats, animal oils, animal waxes; fatty acids from C6 to C24 and their potassium, sodium, calcium and magnesium salts; glycerol.

It seems only logical that if vegetable oils and fats extracted through the use of solvents are exempt from REACH registration, the co-material produced at the same time (the oilseed cake or meal) also should be. That means that oilseeds cakes and meals would qualify for the REACH registration exemptions listed in CMCs 6 and 11 of the Fertilising Products Regulation. Because they are covered by paragraph 9 of Annex V of Regulation (EC) 1907/2006.

V. How the Fertilising Products Regulation currently excludes some oilseed cakes from EU Fertilising Products

Cold-pressed oil cakes and meals

Since no chemical solvent is used, **cold-pressed cakes and meals can be considered to qualify for use in EU Fertilising Products under CMC 2: PLANTS, PLANT PARTS OR PLANT EXTRACTS**, which states “An EU fertilising product may contain plants, plant parts or plant extracts having undergone no other processing than cutting, grinding, milling, sieving, sifting, centrifugation, pressing, drying, frost treatment, freeze-drying or extraction with water or supercritical CO₂ extraction.”

Protein hydrolysates produced from oil cakes and meals after chemical extraction

Recital 26¹ of the Fertilising Product Regulation makes it clear that the requirements of the regulation only apply to the materials that are components of fertilising products and not to input materials that are used as precursors without being contained in the final fertilising product. This means that **when oil cakes and meals are used to produce protein hydrolysates**, but the cake or meal itself is not present in the final fertilising product, the cakes/meals would be considered precursors as described . Therefore the cakes/meals would be outside the scope of the FPR. **The resulting hydrolysed proteins, which are present in the final product, should thus be eligible for incorporation into EU Fertilising Products under**

¹ “The precursors themselves, such as sulphuric acid used as a precursor for the production of single superphosphate, should not be regulated as component materials for the purpose of this Regulation, since chemical safety will be better ensured by regulating as component materials the substances formed from the precursors and actually contained in the EU fertilising product. The obligation to comply with all the requirements of a component material category should therefore apply to those substances.”

CMC 1: VIRGIN MATERIAL SUBSTANCES AND MIXTURES, even if the raw material oilseed cakes / meals resulted from extraction of oils or fats using solvents.

Oilseed cakes and meals incorporated into fertilising products after extraction using solvents

This leaves the **case of vegetable cakes/meals that are incorporated directly into an EU fertilising product, such as an organic-based fertiliser (PFCs 1A and 1B) or an organic soil improver (PFC 3A)**. In these cases, the cake/meal would be an important source of nitrogen and carbon. Since the solvents used to produce vegetable oil and cakes/meals is not contained in the final fertilising product, we can consider them to be precursors that are not subject to the requirements of the Fertilising Product Regulation. The oilseed cakes/meals would therefore be a by-product that is exempted from REACH registration according to Annex V, Para. 9 of Regulation (EC) 1907/2006, as explained above. However, oil cakes/meals that have resulted from oil extraction with solvents do not currently fit into any of the Component Material Categories as outlined below.

The oil cakes/meals are not covered by CMC 1 because oilseed cakes/meals are by-products, which are excluded from CMC 1.

CMC 2 excludes any sort of chemical treatment, such as using solvents, even when the solvents are allowed for producing foodstuffs and are undetectable in the plant-based material used in the EU Fertilising Product.

Some oilseed cakes and meals may be composted or incorporated into digestates, but most are not, so CMCs 3, 4 and 5 would not fully resolve the problem.

CMC 6: **FOOD INDUSTRY BY-PRODUCTS** could provide a partial solution if oilcakes resulting from the extraction of edible oils were added to the list of authorised food industry by-products. However, this would not cover cakes/meals resulting from the extraction of non-edible vegetable oils.

CMCs 7, 8, 9 and 10 are not relevant for plant-based materials.

CMC 11: **BY-PRODUCTS WITHIN THE MEANING OF DIRECTIVE 2008/98/EC** could potentially resolve the problem, assuming that the additional criteria to be developed do not prevent the use of oilseed cakes/meals.

VI. ECOFI suggestions on how to accommodate all oilseed cakes under the Fertilising Products Regulation

Accordingly, it would appear that oilseed cakes and meals could be in CMCs 6 and/or 11 since the cakes and meals are exempted from REACH registration under para. 9 of Annex V of Regulation (EC) 1907/2006, and this exemption applies to these CMCs.

However, CMC 6 could only accommodate some of the oilseed cakes and meals since not all vegetable oils are used in the food industry.

CMC 11 also has its drawbacks, because the criteria that are not yet developed for this CMC could lead to unjustified distortions in the requirements for the use of solvent-treated oilseeds compared with those that are cold-pressed. Furthermore, since CMCs have to be

mentioned on the label, it could be dissuasive for some users to see that “industrial by-products” are included in their organic fertilizers.

Bearing in mind that the solvents used in oil extraction are recovered and volatilise easily, they should be considered precursors, not component materials, ECOFI’s preferred option for addressing the current impossibility of incorporating oilseed cakes/meals resulting from solvent-assisted oil extraction into an EU Fertilising Products would be to modify the first paragraph of CMC 2 as follows:

“An EU fertilising product may contain plants, plant parts or plant extracts having undergone no other processing than cutting, grinding, milling, sieving, sifting, centrifugation, pressing, drying, frost treatment, freeze-drying or extraction with water or supercritical CO₂ extraction. **Oilseed cakes or meals that remain after solvent-based extraction of vegetable oils may also be incorporated in EU fertilising products if the component material is covered by the registration obligation exemption provided for by point 9 of Annex V to Regulation (EC) No 1907/2006.**”

This would put all oilseed cakes and meals on equal footing under the Fertilising Products Regulation – regardless of whether they were being used as precursors for protein hydrolysates or directly incorporated into EU fertilising products as component materials. It would also mean that oilseed cakes and meals would be treated equivalently to the vegetable oils that are extracted from them.

VII. Labelling requirements for EU fertilising products derived from oilseed cakes/meals should be consistent

Annex III, Part I, Paragraph 5 of the Fertilising Products Regulation specifies that “Where the EU fertilising product contains ricin, the following instruction shall be provided on the label: ‘Hazardous to animals in case of ingestion.’” ECOFI supports this labelling practice, which is standard for the industry. However, it discriminates against the use of castor oil cakes.

Other oilseed cakes/meals also have a natural content of undesirable substances, such as glucosinolates, aflatoxin B₁, endosulfan, free gossypol, hydrocyanic acid, theobromine, vinyl thiooxazolidone, and volatile mustard oil. All of these substances are listed in the European Union’s list of undesirable substances in animal feed.

We therefore suggest modifying this labelling requirement as follows:

“Where the EU fertilising product is composed of **any oilseed cake that may contain substances listed in Annex I of Directive 2002/32/EC on undesirable substances in animal feed**, the following instruction shall be provided on the label: ‘Hazardous to animals in case of ingestion.’”