

## Standards consultation – annatto Spring 2012

Annatto is a derivative of the seeds of the tropical tree *Bixa orellana* and is used to produce an orange to red colourant for food. The pigment is found in the outer layer of the seed.

Annatto has been used to colour cheese in the UK since the 16<sup>th</sup> century. The best cheese was considered that made from the richest milk. Natural carotenes in the grass in the summer would impart a yellow/orange hue to cheese, made stronger by the addition of extra cream to the milk. Annatto was used to replicate the colour of the best cheese. Annatto is now used to colour traditional cheeses in the UK, however it is only permitted for organic cheese making for Cheddar, Red Leicester and Double Gloucester (notably excluding its use for Shropshire Blue).

The principal pigment is bixin, the *cis*-form of the mono-methyl ester of a carotenoid carboxylic acid. The total pigment content of seeds (expressed as bixin) can vary widely, both between and within production areas; the best quality seeds on the market contain over 3% bixin but supplies from several major sources often have only about 2%. The main countries of production are Kenya and Peru. As a food additive annatto has the E number E160b; bixin and norbixin, colouring constituents of annatto, also share the same E number. Norbixin is formed in the extraction process when bixin is mixed with an alkali (see below) and has a very slightly different chemical structure to bixin.

Soil Association standards currently require only water-extracted annatto to be used, whereas the EU Regulation 889/2008 on organic production and labelling does not specify the method of extraction and allows the use of bixin and norbixin.

The Processing Standards Committee is recommending:

1. Removal of the stipulation that annatto must be water extracted, allowing extraction by the processes described below.
2. That Soil Association standards allow bixin and norbixin (constituents of annatto), as in the organic EU Regulation 889/2008.

### **Proposed change to Soil Association standard 40.8.16**

You may add ~~water-extracted~~ annatto, bixin and norbixin to Red Leicester, Double Gloucester, Cheddar and Mimolette Cheese, but you must include it in the calculation of organic agricultural ingredients.

### **Methods of annatto extraction**

The particular type of extract used is dependent on the food product and the need for the pigment to be oil-soluble or water-soluble. For cheese making, water-soluble annatto is used.

Water-soluble extract can be produced in two ways.

1. The most common process involves direct extraction of the seed with aqueous alkali, usually sodium or potassium hydroxide. Typically, seed is soaked or stirred in dilute aqueous alkali for about 10 minutes at a temperature below 70°C. This transforms the natural bixin in the seed coat to a simple water-soluble derivative, the salt of norbixin. The alkaline extract is filtered and then acidified with dilute mineral acid (usually sulphuric or hydrochloric acid) to precipitate free norbixin. The precipitate is partially de-watered in a filter press to obtain a weak paste. This may be concentrated by evaporation of water for sale as a paste or be

subjected to full dehydration, followed by milling to obtain a dried, powdered product<sup>i</sup>.

2. The alternative process for water-soluble annatto production is the extraction of bixin from the seeds using a hot vegetable oil followed by treatment with an alkali.

Extraction of bixin can also occur by using an organic solvent, such as hexane, methylene chloride or acetone which Soil Association standards would not allow. The proposal is to allow annatto extracted using the extraction methods in points 1 and 2 above.

If you would like to comment, please email [consultation@soilassociation.org](mailto:consultation@soilassociation.org) by Friday 25<sup>th</sup> May 2012.

Please remember that the online standards are always the current edition at [www.soilassociation.org/organicstandards](http://www.soilassociation.org/organicstandards)

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<sup>i</sup> [Major Colorants and Dyestuffs Entering International Trade, Annatto Seed and Its Extracts](#) from the UN's [Food and Agriculture Organization](#)