

Strategy to achieve further reductions in the plasticiser contamination of edible oils and fats

For 10 years, the BNN¹ orientation values for olive oil have successfully contributed to assuring the quality of organic edible oils in the organic food sector.

To further minimize contamination with plasticisers, the oil producers who are members of BNN have redefined good manufacturing practice so that it now excludes articles made of soft PVC from the entire processing chain. This definition aims to meet the high expectations consumers have of organic edible oils. Excluding soft PVC is the most effective strategy to prevent plasticiser contamination. Some plasticisers may also originate from general environmental contamination, but at significantly lower levels than from soft PVC.

Soft PVC can be used for hoses, seals, in foil, brackets, sieves, glue, bowls or other items that are usually characterised by high elasticity. Soft PVC consists to a large degree of plasticisers. These are not tightly bound in the plastic material and migrate very easily into oils and fatty foods. Furthermore, an additional argument against the use of soft PVC is that the incineration of PVC can release dioxins, a persistent environmental contaminant. There are suitable alternative materials for contact with foods such as silicone or PE; these materials do not require plasticisers and do not produce dioxin when burnt. Excluding soft PVC will reduce contamination from all plasticisers in oil. This agreed exclusion goes beyond the legal requirements, since the general food law does not provide for a ban of soft PVC.

To check the exclusion soft PVC in the processing chain of organic oils a percentile framework will be developed in BNN. This is done by collecting plasticiser residue data in the general BNN monitoring of dry goods ([BNN-Monitoring Trockensortiment](#)). In this way a continuous process of minimisation is triggered; the highest findings are researched and eliminated before turning to the next highest values as the next step. In this way all common plasticisers used in soft PVC will be considered, not only those subject the regulated reference values.

¹ BNN = German Association of Organic Processors, Wholesalers and Retailers
(in German: Bundesverband Naturkost Naturwaren, BNN e.V.)

The previous orientation values for plasticisers of 3 mg/kg for DEHP and 5 mg/kg for all other adipates and phthalates (See appendix I) in organic olive oil have been revised and adapted as follows:

- **Renamed as reference values:** The renaming is done to delineate the importance of reference values as limits in comparison to the importance of the BNN orientation value for pesticides ([BNN-Orientierungswert für Pestizide](#)) which describes a concept using a threshold to trigger research into the origins of the contamination. Oils exceeding the reference values will, as before, no longer be traded in the specialised organic sector (analytical variance may be taken into account).
- **The reference values are applicable to all organic vegetable oils and fats** which will be sold as such to consumers and is no longer restricted to organic olive oil.
- **The reference values for DEHP and DBP have been lowered to 1mg/kg** - analytical variance may be taken into account.

BNN recommends that when an analysis result of 1 mg/kg without considering analytical variance occurs, urgency be given to establishing the cause in order to stop the contamination.

Since 2011, the EU has banned the use of DEHP and DBP in equipment and machinery in contact with fatty foods (Regulation (EC) No 10/2011).

There will be a transition period of two years for lowering the reference values for DEHP and DBP for goods from third-countries. Research to establish the cause with subsequent stopping of the pathway of contamination should definitely also here be triggered by an analytical result of 1mg/kg.

During a transitional period until 31.12.2017, an analytical variance of 50% as previously used is still tolerated². Within this period the BNN will evaluate the actual analytical uncertainty of determining phthalates and other plasticisers in edible oils under the terms of reference for BNN recognized Laboratories ([BNN-Laboranerkennung](#)). The BNN promotes good laboratory quality through their laboratory recognition scheme. Laboratories that have demonstrated their expertise in the field of

² According to the [Scientific advisory board of BNN](#) as well as scientific data, laboratories should be able to work with an analytical uncertainty of 30% for plasticisers in oil. Horwitz und Albert (1997) as well as Thompson (2012) determined a level of analytical uncertainty of 22-32% at concentrations 1mg/kg over a large number analyses in a large number of situations which correspond to the conditions of plasticisers in oil. At higher concentrations, the analytical uncertainty declines below this level.

plasticiser analysis in oil, are named [here](#) with respect to contaminants in oilseeds, oils and fats (part of the product category B3).

The analyses carried out are risk based.

In implementing the minimisation strategy, it seems sensible to take into account the date of harvesting and pressing of the different oils.

All legal requirements must be adhered to, of course.

For checking of materials for soft PVC, the BNN makes video instructions for the Beilstein test available to its members. Using it PVC detection can be done with very simple means (paper clip, pliers and lighter). However, it should be noted that tubes can be constructed of several layers of different plastics, of which preferably the inner, but if possible all, have to be checked.

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Appendix I

Orientation values for plasticisers since April 2006, replaced in March 2016, by this paper:

3 mg/kg for DEHP

5 mg/kg for all other adipates and phthalates

Preliminary orientation values for plasticisers up until harvest 2005/2006:

6 mg/kg for DEHP

10 mg/kg for DIDP, DiNP, BBP and others (each)