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Public statement on the use of the BNN orientation value for hexachlorobenzene (HCB) detected in organic pumpkin seeds from the European Union

BNN orientation value

Organic products are defined by the process of their production and processing, e.g. by the non-use of synthetic chemical pesticides and mineral fertilisers. Also, the regulations for organic farming refer to the production processes and their inspection and certification. Organic products are therefore not defined by the absence of pesticides and as a consequence organic regulations have consciously not developed maximum residue limits for pesticides.

Evidence of non-permitted substances in organic farming can be an indication of an unauthorised application and consequently of illegal labelling as an organic product. Because organic agriculture does not take place in isolation, any pesticide levels determined may also be due to unavoidable or accidental contamination or ubiquitous environmental background pollution. The cause of this external pressure is mainly the massive amount of pollution from industry and intensive conventional agriculture. Although some of the persistent organic pollutants have been banned for decades they can be detected even in very remote parts of the world such as the polar regions, and in organic products. Furthermore, materials may be used in a variety of applications and in addition to their use as an active ingredient in a pesticide, may be a component in other completely different products such as packaging materials, printing inks or disinfectants.

The Association of Organic Processors, Wholesalers and Retailers (in German: **Bundesverband Naturkost Naturwaren = BNN e.V.**) has adopted a benchmark for pesticides in order to differentiate in a practical and flexible way cases of fraud and unintentional errors in the process of production and processing from accidental and unavoidable contamination.

The BNN orientation value is not a maximum residue limit, but rather describes a **case by case assessment**, in cooperation with the competent certification body whenever the value of 0.01 mg/kg of active substance in the unprocessed raw material is exceeded to determine if the **rules of organic farming** were complied with. If this is the case, the product concerned may be traded from the perspective of BNN.

HCB in pumpkin seeds from the European Union

Hexachlorobenzene (HCB) is not approved for use in organic farming. Therefore, if the substance is found in a sample the cause of the contamination has to be researched (usually by the inspection body) as described above.

Based on the opinions and publications in the annex, the Scientific Advisory Council of the BNN came to the conclusion that even when complying with all European and national legislation for organic farming, unavoidable levels of HCB in pumpkin seeds due to historical contamination (HCB was used in conventional cereal crops until the 1980's as a seed treatment against fungal infections) can occur in soils.

On the one hand to do justice to the needs of the consumer for protection from residues in organic products and on the other to respect the responsible organic farmers conforming to organic regulations, the Scientific Advisory Council recommends viewing a content of up to 0.05mg HCB per kg of pumpkin seeds as unavoidable.

This will be subject to the following restrictions:

1. The scheme applies only to organic pumpkin seeds from the European Union (as at 2014).
2. The value specified in the test report of the laboratory is directly applicable. An extended measurement uncertainty is not applicable.
3. When calculating the content of HCB determined in a pumpkin seed oil sample back to the content of the pressed material (pumpkin seeds), a processing factor of 2.4 is to be applied (e.g. if the content in the pumpkin seed oil is 0.05 mg/kg, this corresponds to a content in the pumpkin seeds of 0.021 mg/kg (see Opinion Institute Dr. Wagner).

Reason:

1. The pumpkins, from which the corresponding pumpkin seeds and the pumpkin seed oil are processed, has the special property of absorbing HCB and other lipophilic chemical substances from the soil and storing them in the fats contained in the seeds. This property has been extensively studied as early as 1991 in a PhD thesis at the Vienna University of Technology (Ecker, Sonja).
2. This accumulation phenomenon of oil seed pumpkins (shared with other plants, such as the cucurbit family) has resulted in the maximum residue levels in the European residue legislation in such crops being adjusted when the contamination is from ubiquitous environmental background pollution. This includes contamination by deregistered pesticides such as dieldrin, chlordane, DDT and HCB. According to Regulation (EC) No 396/2005 the general maximum residue level (MRL) is 0.01 mg/kg for these substances, for HCB specifically 0.02 mg/kg (the limit of detection at the time), but Directive (EC) No 2007/56 lifted the permissible level in pumpkin seeds to 0.05 mg/kg.

" For hexachlorobenzene information has been communicated to the Commission that this pesticide, due to environmental contamination, can occur in pumpkin seed, a commodity that is consumed as a food in several Member States, at levels higher than the limit of analytical determination. The insertion of pumpkin seed in Annex I to directive 90/642/EEC and setting of MRLs for pumpkin seed are therefore necessary to protect consumers from excess hexachlorobenzene residues. "

A toxicological assessment was done to establish the new MRLs so that aspects of consumer health protection were taken into consideration.

3. The mobility and thus the bio-availability of HCB, which is a "dormant" background contaminant in agricultural soils depends to a large degree, as studies carried out in Austria showed, on the particular seasonal weather conditions (AGES, 2008). Since HCB is highly volatile the residues bound in the soil are released especially during drought and high temperatures in summer (see Section 10.1.1 on page 72 of the AGES study). This may result in different concentrations of HCB in pumpkin seeds from season to season,

so that consideration of the contributing conditions (worst case scenario) seems reasonable.

4. Results of HCB analyses in raw material for the year 2014, submitted by the applicant showed the following data (for Austrian products):

Average of all batches (155 individual batches): 0.016 mg/kg

Median: 0.013 mg/kg

Individual batch levels > 0.05 mg/kg: 5 representing 3.2%

Both the average and the median of the data sets from Austria showed a reduction when comparing harvests from 2012 with those of 2014 (the sample sizes are comparable - 130 and 155):

Year	Median HCB	Average HCB	Number of Samples > 0,05 mg/kg
2012	0.032	0.028	19 (14.6 %)
2014	0.013	0.016	5 (3.2 %)

5. BNN members also submitted three further sets of data for pumpkin seeds:

- Pumpkin seeds, origin Germany: 0.019 mg/kg HCB
- Pumpkin seeds, origin Germany: 0.030 mg/kg HCB
- Pumpkin seeds, origin Czech Republic: 0.029 mg/kg HCB

These levels are within the normal range observed in data from Austria to date and thus support those figures as well as the extension to other EU member states.

6. Sources other than ubiquitous environmental background contamination of the soil can, according to the AGES study, be considered negligible for the HCB contamination of oilseed pumpkins.
7. The Austrian organic codex has removed the existing limit of 0.01 mg/kg for HCB in certified organic pumpkin seeds and instated the EU limit of 0.05 mg/kg in its place¹. In terms of harmonized internal European trade, also in relation to the requirements for products from organic production, this aspect should be taken into account, especially as it is consistent with points 1 to 6.

Analytically detectable levels of hexachlorobenzene (HCB) to a maximum of 0.05 mg/kg in pumpkin seeds from the European Union are for the reasons given above to be classified as technically unavoidable and as unpredictable traces due to the general environmental exposure to HCB from earlier applications of pesticides in conventional

¹ http://www.bmg.gv.at/cms/home/attachments/4/9/6/CH1252/CMS1167207128242/a_8_bio.pdf
(see Chapter 3.1, p. 36)

agriculture. These findings alone do not justify a doubt that products labeled with reference to organic farming are not of organic quality (measures according to Art. 91 of Regulation (EU) 889/2008), providing the legal basis for organic farming has also been met.

Additional recommendations:

In addition to this, the Scientific Advisory Council recommends to producers who regularly find levels of HCB above the BNN orientation value in their pumpkin seeds to discuss and possibly take action to reduce the long-term content of HCB. Detailed instructions on this are contained in the AGES study cited below.

Furthermore, the monitoring activities (analysis of commodity lots) for each new season are to continue as before, and be submitted to BNN no later than 30.11 of each calendar year, so that the public statement from the BNN concerning HCB in pumpkin seeds can be reviewed for each new season.

Should the tendency of decreasing HCB residues (see 4.) continue over a three to five year period, the current value of 0.05mg/kg shall be reviewed downwards with the new value being set by 1st April 2020 at the latest.



Meinrad Schmitt, Chairman of the Board

Grundlagen/Literatur

Ecker, Sonja, G. (1991): Die Aufnahme von Hexachlorbenzol durch den Ölkürbis. Dissertation Universität Wien

Commission Directive 2007/56/EC of 17 September 2007 amending certain Annexes to Council Directives 86/362/EEC, 86/363/EEC and 90/642/EEC as regards maximum residue levels for azoxystrobin, chlorothalonil, deltamethrin, hexachlorobenzene, ioxynil, oxamyl and quinoxifen

AGES (Österreichische Agentur für Gesundheit und Ernährungssicherheit GmbH) (2008): Ausarbeiten von Risiko-Management-Optionen zur Minimierung der HCB-Belastung von österreichischem Ölkürbis. Wien.

Österreichisches Lebensmittelbuch IV. Auflage Codexkapitel / A 8 / Landwirtschaftliche Produkte aus biologischem Landbau und daraus hergestellte Folgeprodukte

http://www.bmg.gv.at/cms/home/attachments/4/9/6/CH1252/CMS1167207128242/a_8_bio.pdf

Stellungnahme Institut Dr. Wagner, Lebring, Österreich vom 11.02.2013 (can be provided upon request)