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Documentation of the results of the expert talks regarding Nitrite/Nitrate in Bonn on the 12th November 2009

Introduction:

The regulations passed by the European Union (EG-VO 889/2008 Art. 27 (3) a) pertaining to organic farming provide that the use of sodium nitrite and potassium nitrate or the ban of these additives have to be reconsidered by 31st December 2010.

The re-examination referred to in point (a) shall take account of the efforts made by Member States to find safe alternatives to nitrites/nitrates and in establishing educational programmes in alternative processing methods and hygiene for organic meat processors/manufacturers. (Art. 27 889/2008)

What research preliminaries have taken place and what are the conclusions? What kinds of qualification and training measures have been realized? What was the experience gained on the market during the past years with meat products either completely free of curing substances or showing minimal quantities thereof.

1. Lectures

1.1 Christine Balduf: Achievements of the Bundesanstalt für Landwirtschaft und Ernährung (Federal Institute for Agriculture and food, BLE) (enclosures 1 and 2)

Mrs. Balduf presents the achievements of the BLE in relation to the relevant R&D projects during the last years. Various projects deal with safety and market issues and with the availability of alternative technologies. In addition, in 2008 the BLE has published guidelines about the „production of organic meat and sausage products without or with reduced use of Nitrite/Nitrate substances“. These guidelines are available online or may be obtained from the Research Institute of Organic Agriculture FIBL (www.fibl.org). Moreover the BLE has completed a series of training measures (enclosure 1). Mrs. Dylla reports that in 2009 115 butchers participated in their training programmes and are showing great interest especially in technological issues (enclosure 2).

1.2 Prof. Dr. Friedrich-Karl Lücke: „Product safety without or with the reduced use of Nitrite/Nitrate“ (enclosure 3)

Only by using more than about 50 mg/kg sodium nitrite can we observe an antimicrobial effect; with regards to colour and flavour 20 – 50 mg NaNO₂/kg are sufficient. The nitrite effect inhibiting pathogen growth depends on the pH-value and the iron content. Adding nitrite to meat products only contributes to their safety and shelf life if the products have not been previously stabilised by means of other „obstacles“ (Hürden). The nitrite effects inhibiting the growth of Clostridium contribute to the safety of uncooled scalded sausage (Brühwurst) preserves which – for sensory reasons – have not been submitted to “botulinum cook”. The pathogen growth of Listeria monocytogenes on cold sausages (Aufschnitt) can hardly be inhibited by adding nitrites. Avoiding recontamination is essential also with regards to shelf life. Adding 100 mg NaNO₂/kg to raw sausages helps inhibiting salmonellae at the beginning of the maturing process. There is only little influence on the deactivation of these and other

pathogenic bacteria in the course of maturation. All in all the antimicrobial effect of the nitrite can be compensated by means of covering measures in order to produce safe meat products adding reduced nitrite or none at all. Especially with scalded sausage preserves and raw sausage products an adjustment of recipes and processes is required thus involving noticeably higher costs. Compensating the nitrite effects on the sensorial qualities of the products and the oxidative rancidity during storage is more difficult (enclosure 3).

1.3 Jan Kabisch „Tenacity of *Listeria monocytogenes* in raw sausage exposed to various plant extracts“ (enclosure 4)

Raw sausage products are only stabilised when fermented correctly. Eventually the safety of the final product depends on both the process itself and the conditions of this process as well as on additives and the quality of the raw material. The raw material (pork or beef) for the preparation of raw sausage products may be contaminated with various pathogens. Therefore nitrate and nitrite serve as additives for preservation and the growth inhibition of pathogenic bacteria in raw sausages. Nitrates are mainly used in slow cure products and must be reduced to nitrite by chemical or microbiological reactions. As these processes are slow but continuous, the nitrite may develop its positive effects over a longer period.

Nitrite has a positive impact on colour, flavour, shelf life and the reduction of oxidative rancidity. A principal concern and unwanted side-effect is the reaction of nitrites with protein components forming potentially carcinogenic nitrosamines. Consequently the consumer generally prefers plant-based ingredients to chemical additives. Sausage products without Nitrite/Nitrate may be declared preservative free. This also applies to products containing colouring plant-based extracts which might show a very high natural nitrate content. The natural nitrate content is a result of the microbial reduction to nitrite and may therefore also contribute to the formation of nitrosamines.

An internal investigation has revealed that adding a commercial available extract to raw sausage products did not have any antimicrobial impact on pathogens. Due to the colouring, a reddening process is being simulated thus representing an important food safety problem. Especially considering *Listeria monocytogenes* we conclude that a ban on nitrite curing salts involves increased risks.

1.4 Christoph Spahn „Marketing of organic meat and sausage products with and without addition of curing substances“ (enclosure 5)

What does the consumer think about the use of Nitrite/Nitrate in organic meat and sausage products? There is very little documentation on this subject, and we have used the FiBL-studies about the acceptance of organic meat free of Nitrite/Nitrate as well as consumer studies on organic meat products in the organic retail trade.

With the corresponding results we came to some conclusions about the consumers' attitude and the market relevance.

The consumers behave ambivalently. On the one hand they ignore the problematic nature and discussions about Nitrite/Nitrate and behave accordingly. On the other hand they do care if Nitrite/Nitrate is added to organic products or not. We therefore generally proceed on the assumption that the consumer basically prefers and expects organic products without additives but that he will still buy them because reddened sausage (as to colour and taste) meets with his expectations.

In respect of the market relevance we estimate that a ban of Nitrite/Nitrate could considerably inhibit the growth of the organic meat market. This slowdown though might partly be compensated by realising a broad information campaign.

2. Summary of the discussion with the attending experts

2.1 Issue 1

„Are all German Organic butchers (EU) skilled to safely produce all sausage and meat products without Nitrite/Nitrate?“ (enclosure 6)

Some companies are able to produce a wide range of sausage products without Nitrite/Nitrate. Many butcher's companies however are lacking the necessary facilities and know-how. There are some common sausage products which cannot be safely produced without adding Nitrite/Nitrate and the controllability of „worst-case“-scenarios with raw sausages is not ensured. Regarding scalded sausage products (Brühwurst) there are shelf life problems especially within the logistics chain of food retailing. Some companies are successfully employing vegetable powder providing nitrate as a substitute. Possible substitute strategies are however controversial as the corresponding technological impacts are not yet known, and possible negative side effects cannot be excluded. Furthermore it is determined that any possible consumer fraud resulting from such alternative technologies has to be ruled out. Emphasis is laid on the fact that the need for research on production methods free of Nitrite/Nitrate and compensatory strategies and their impacts is substantial. The freedom of decision and the development potentialities are important for butchers as they legally answer for the product quality. In Germany there are still conflicting priorities with the principles of the German Food Code (Leitsätze des Deutschen Lebensmittelbuchs) defining the name under which the product is sold (Verkehrsbezeichnung).

2.2 Issue 2

„Is there a chance to successfully continue developing the German (EU) market for organic sausage products without Nitrite/Nitrate?“ (enclosure 6)

We all agree that we cannot link the organic meat products to Nitrite/Nitrate only, but that we have to consider the subject from a holistic point of view. Some participants said that we have to hold on to the objective of the ban of Nitrite/Nitrate for the purpose of minimising the use of additives. Other participants considered that the use of Nitrite/Nitrate should be maintained as a traditional production technique because nitrate has been used in the production of sausages already over 2000 years, and many sausage products are characterised by this additive. It is beyond debate that Central Europe offers an unparalleled assortment of diversified traditional sausage and meat products, and the regional traditions in the EU are very different.

The short- and middle-term consequences of a Nitrite/Nitrate ban for the market are considered to be negative or even worse. Particularly the sales opportunities in the new markets (retail) would deteriorate sharply (product appearance, pricing, minimum durability) for different reasons causing extensive consequences to agriculture. In some markets (organic market) products without Nitrite/Nitrate so-called „grey products“ may be considered placeable, in other market segments however their tradeability is generally out of the question. To reposition the whole sausage assortment would be very costly and time consuming.

Other points of discussion were also that small butcher companies would possibly be driven out of the market. And this makes very clear that a competent evaluation of the Nitrite/Nitrate-avoidance-strategies has to be carried out with absolute accuracy, especially with regards to a “truthful” declaration.

According to many participants the clients' freedom of decision with relation to sausage products (Nitrite/Nitrate-additive is obvious and has been declared) is of great importance. It has mainly been agreed upon that a ban of Nitrite/Nitrate by 1st January 2011 would be premature and initially cause considerably negative effects on the total market.