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Press Release

“Food Extrusion Seminar 2014” at Coperion – a detailed insight into the complexities of food extrusion

Stuttgart, June 2014 – “The Food Extrusion Seminar 2014”, which Coperion organized in collaboration with the German Institute of Food Technologies (DIL, www.dil-ev.de), Quakenbrück, Germany, at Coperion GmbH, Stuttgart, Germany, on May 6 and 7, 2014, met with a highly rewarding response. The organizers of this intensive two-day seminar were able to welcome around 40 participants from Germany, the Netherlands, Denmark and Switzerland. The participants mainly came from the production and product development departments of food manufacturing companies. Speakers from Coperion, Coperion K-Tron and DIL as well as guest speakers from Neuheus Neotec Maschinen- und Anlagenbau GmbH, Reinbek, Germany, and Mars Petcare Deutschland, a subsidiary company of Mars GmbH, Verden, Germany, presented diverse technological aspects of food extrusion. The presentations were complemented by a visit to Coperion's new Food Test Lab, where one of the highlights of the seminar was a demonstration of high-moisture extrusion of textured soy protein as a meat analogue. This series of seminars, which began last year at the DIL, is scheduled to continue in 2015.

In their lectures, the experts covered the entire food extrusion process from start to finish, providing the participants not only with basic knowledge but also information on the latest developments and trends. As an example of a versatile, continuous production system for food extrusion, Coperion's ZSK twin screw extruder was described and explained in detail. This extruder owes its versatility to the numerous different process steps that take place within its process section – from mixing, plasticizing, cooking, denaturing and sterilizing of the foodstuff through to forming, cooling and cutting of the end product. The possible applications for the ZSK twin screw extruder range from the production of direct expanded breakfast cereals and

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snacks, the modification of flour and starch, the production of chocolate and caramel masses and confectionary through to the microencapsulation and the maillard-reaction of flavours and the production of pet foods (e.g. dry cat/dog food). Seminar participants were presented with the range of products that can be produced as well as with what influence respective formulations or recipes and the geometrical and processing parameters of the extruder have on the ultimate properties of the end product produced. Possible ways of optimizing the process when extruding natural products, which by reason of their different origins display widely fluctuating starting properties, were also discussed.

Wide varieties of vegetable raw materials – high-moisture extrusion for new, high-grade meat substitutes

Of particular interest to the participants was the demonstration on a ZSK 26 laboratory extruder (26 mm screw diameter): high-moisture extrusion of textured soy protein concentrate (fat content <10%) into a vegetable meat substitute. This was one of the themes discussed in the theoretical part of the seminar. In this demonstration the moisture content exceeds 50% (up to 70% in individual cases), which is comparable with the moisture content of lean meat.

Developed up to production levels by DIL, this high-moisture extrusion process can be used for the production of meat analogues featuring a fibrous, meatlike structure virtually identical to that of poultry, pork or beef. Decisive factors here are the process of protein denaturation in the extruder and the control of the downstream cooling and fibrillation process in the special cooling die, the length of which may considerably exceed that of the extruder process section.

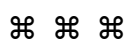
The high water content is added to the vegetable protein directly after the feeding into the extruder. Suitable starting materials for meat analogues are not only soy but other high-protein vegetable products, such as peas and lupins. Further ingredients, such as minerals, fibers and flavours, can be added during the extrusion process. The texturates obtained through extrusion are semi-finished products that are then subsequently processed into different end products, typical examples are fried nuggets, marinated chunks or salad toppings – all completely vegetarian but with a tasty meat flavour. The combination of vegetable and animal proteins as starting materials is likewise possible with high-moisture extrusion. The seminar participants were able to taste freshly prepared product samples that had been produced beforehand at the DIL.

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The second example of application to be demonstrated in Coperion's new Food Test Lab was the manufacture of breakfast cereals on a ZSK 43 MEGAvolume PLUS twin screw extruder. The machine was used to demonstrate the production of so-called puffed microballs made from wheat and rice flour enriched with sugar, whey protein, calcium and salt. This product is small, crusty balls directly expanded in the extruder, as used, for example, in the making of "crunchy muesli", "crunchy yogurt" and chocolate fillings, to name only three of many applications. The demonstration part of the seminar was rounded off with a display of 100 product samples testifying to the diversity of applications possible with food extrusion.

Coperion (www.coperion.com) is the international market and technology leader in compounding systems, feeding technology, bulk materials handling systems and services. Coperion designs, develops, manufactures and maintains systems, machines and components for the plastics, chemicals, pharmaceutical, food and minerals industries. Within its four divisions – Compounding & Extrusion, Equipment & Systems, Materials Handling and Service – Coperion has 2,500 employees and nearly 40 sales and service companies worldwide.

The German Institute of Food Technologies (DIL), Quakenbrück and Brussels, is located at the heart of Germany's agriculture and food industry (www.dil-ev.de). A very well-established team of around 160 experts has been developed in connection with the institute over the past three decades. The team taps new potentials every day and paves the way for innovations. With more than 150 member companies from the food industry and related fields, DIL operates as a research institute working in the areas of product development, process development and analysis. The institute's competences and technical capabilities span the full range of food technologies.



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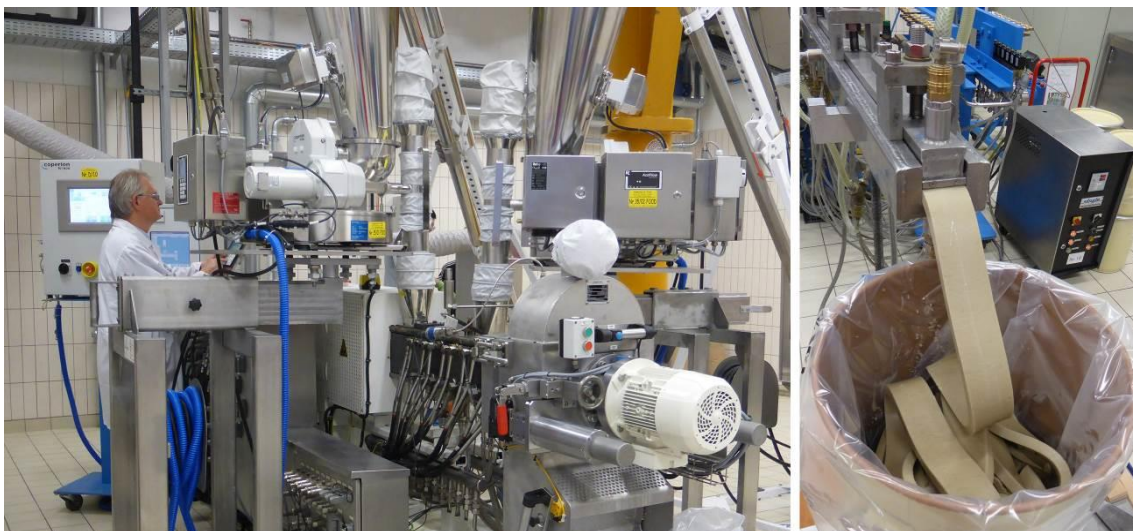
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The Food Extrusion Seminar 2014 at Coperion combined expert lectures (left) with practical demonstrations and exercises. Photo right: Practical exercise requiring participants to equip co-rotating ZSK screw shafts with mixing and shear screw elements according to a given layout.



The ZSK 43 MEGAvolume PLUS (photo left) installed in Coperion's new Food Test Lab and fully equipped with peripherals demonstrated the extrusion of direct expanded cereals at the seminar. A ZSK 26 also demonstrated the newly developed high-moisture extrusion of vegetable meat analogues (photo right).

Photos: Coperion, Stuttgart