

Reformulation – Fat reduction in deep-fat fried bakery products

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In 2015, the German Federal Government initialized a strategy for the reduction of sugar, salt and fat in convenience products. Therefore, the Max Rubner-Institut (MRI) was asked to develop solutions for the reformulation of different food groups. In the course of this initiative, the Department of Safety and Quality of Cereals of the MRI investigates aspects of fat reduction in deep-fat fried bakery products.

Deep-fat fried products are yeast-raised wheat pastries such as “Berliner Pfannkuchen” and donuts, which are fried in hot fat. Current trends show that these deep-fat fried bakery products enjoy growing popularity and are internationally well known. They belong to the group of pastries which have a fat content of 9 % at least based on the German Guidelines for Pastries [1]. Frying further increases the fat content. That makes such bakery products particularly rich in fat. Due to this fact, the aim of the project is to investigate to what extent additional fat absorption can be reduced during the frying process of “Berliner Pfannkuchen” by modifying the recipe.

The relevant literature shows that, amongst other methods, increasing the water absorption of the dough can reduce its fat absorption. Based on a basic recipe, comparative investigations are carried out systematically, under constant conditions and with a practical orientation. Thereby, approaches already known from the literature and new approaches are tested.

In the first part of this project, the water absorption is increased by mechanically damaging the starch particles during the grinding process of wheat to flour type 550. In the second part, the water absorption of the dough will be increased by adding different water-binding additives (cellulose derivatives, wheat-based additives, rice-based additives, plant fibers). In the third part, the effect of coatings (clear coating) on the dough will be recorded. Furthermore, a physicochemical analysis of the coatings will be carried out. Finally, a preference test including the best products from the three methods will help to evaluate consumer acceptance.

A comparison of “Berliner Pfannkuchen”, produced of flours of two wheat varieties with different water absorption capacity, showed that increased water absorption had no significant influence on the additional fat absorption. However, it could be shown that the use of high quality flours can reduce the total fat content of the baked goods. The addition of different water-binding additives to the selected basic recipe could not reduce significantly the total fat content. Pastry products made of a commercial baking mix had a significantly higher fat content. Due to the special production method of "Berliner Pfannkuchen" the fat prefers to enter at the bottom of the pastry products through the seam at the dough.

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[1] Leitsätze für Feine Backwaren [Guidelines for Pastry] from 17./18.09.1991, last revision 08.01.2010 (BAnz. No. 16, 29.01.2010, GMBI No. 5/6 p. 120 ff, 04.02.2010)

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