

The Impact of Gum Additives on the Process of Dough Forming and Quality of Macaroni Products

V.G. Urchak*, S.D. Palivoda, T.P. Golikova
National University of Food Technologies, Ukraine

The central question of the macaroni products quality provision, especially when using the bread-quality wheat flour, which is often characterized by its low quality, as well as in case of poor quality of technological processes, particularly at small factories, is extremely actual. The battering of such products quality as well as provision of good cooking properties looks attainable by means of introduction additives of structure-forming action. Such additives as guar gum, locust bean gum and tara gum possess good high structure-forming capacity, and their application in different branches of food industry leads to positive result.

This paper deals with the impact of such additives introduction upon the dough kneading, forming, and, as a result, upon the quality of macaroni products.

Macaroni dough with a humidity of 35 % has been kneaded in a laboratory press "MAKMA-M". In the dough production the wheat flour of medium power with gluten content of 26 % has been used. Gums have been introduced in the amount of 0.05 ... 0.25 % to the wheat as a colloidal solution which earlier has been prepared on the basis of whole amount of water as per recipe.

The deviation of crumby of the dough has been studied as well as a velocity of forming and the capacity of press. Crumby of macaroni dough has been determined by the sieving analysis of dough sample with the mass of 500 g through the set of 4 metal sieves numbers 7, 5, 3 and 1 and respective fractional weighing.

The content of different fractions of crumbs was depicted as a percentage to the sample mass. The velocity of pressing has been determined by measuring of raw products length pressed out during 30 seconds and has been presented in mm/s, whereas the capacity of press – in kg/hour – by means of measuring these products.

Ready made macaroni products were analyzed per their organoleptic, physical-chemical (strength) and cooking properties.

It has been discovered that with the introduction of minimum amount of guar gum and locust bean gum the amount of bigger fraction crumbs has increased which confirms the aggregate action of these gums. With the increase of these additives the dough becomes drier and crumbs become smaller. In this case a more significant influence towards the quality of dough has the binding effect of the additives with humidity, and the humidity deficiency for the gluten formation.

The introduction the tara gum additive with the bigger dosage has a negligible effect upon the crumby of macaroni dough.

Gums of herbal origin facilitate the increase of pressing velocity, particularly guar gum and locust bean gum, which is a result of macaroni dough plasticity increase. The introduction of tara gum influence insignificantly upon the pressing velocity as well as upon the capacity of press.

The best bettering effect has been observed at the introduction of guar gum and locust bean gum for macaroni products. The best characteristics of macaroni products were observed at the dosage of gums of 0.15 % to the mass of flour and included the following: the bettering of surface quality, strength and cooking properties of macaroni products.

Keywords: macaroni product, wheat flour, kneading, forming, quality