

RESEARCHES REGARDING THE OPTIMIZATION OF THE OPERATING PROCESS OF WHEAT DEBRANNING FOR GRINDING

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Abstract

Debranning is an operation which removes parts or the entire outer layer of wheat seeds, resulting in the removal of dust particles adhering to the surface of the grain and it also clears the wheat kernels hair. The debranning operation of cereals has a large influence on the grinding work process, on the content of minerals of the flour, on germs separation and broken kernels content; for these reasons the purpose of this paper is to optimize the constructive and functional parameters of the wheat debranning installation, namely to maximize the technological work process. In order to achieve the objective of this paper, a test rig was designed and built in order to study and optimize the operating process for wheat kernels debranning; the technological line consists of: horizontal debranning machine with frusto active bodies made of Eureka type braided wire and an aspiration system. In order to study the influence of debranning operation on the quality indices of wheat seeds, several structural and functional parameters of the machine were varied and the variations of the following indices were observed: broken kernels content, ash content and the amount of peeled coating. As a result of the laboratory investigations it was found that the percentage of broken grains, the ash content and the amount of peeled coating varies with the rotor speed and the distance between the two frusto jackets. The percentage of broken grains is directly proportional to the inner jacket speed and inversely proportional to the distance between the two conical drums made of braided wire. The experimental tests showed that the percentage of ash was affected by the rotor speed and the distance between the two drums of the debranning machine. Corroborating the results regarding the content of broken grains, percentage of ash and the amount of peeled coating led us to the conclusion that the optimum operating regime of the machine was obtained when the distance between the tapered drums was $d = 10$ mm, the rotor speed was 150 rev/min and 250 rev/min respectively.

Key words: wheat, debranning, conditioning
