

EXPERIMENTAL RESEARCH ON THE ROLE OF EQUIPMENT FOR COMPLIANCE ON THE QUANTITY OF ASH FROM WHEAT FLOUR

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Abstract: *The paper presents the results of experimental research on conditioning of wheat before milling, performed with two sets of machines with different performances, called versions I and II. In all the 6 pairs of samples of wheat analyzed to find noticeable reduction of the ash content of the version II compared to version I, after each of the 2 steps of peeling and to increase the quantity of flour obtained, especially that the high quality.*

Key words: *wheat, conditioning through peeled, ash content.*

1. Introduction

After harvest grains containing a large quantity of foreign objects, must be removed prior to grinding required; also is necessary partial shelling beans, processes included in general surgery, called conditioning [5]. Besides the mechanical compliance is necessary and a conditioning hydric to bring grain from 15.0-15.5% moisture required complete separation with minimal energy consumption shell core [3],[4]. The more complete the separation, the ash content of the resulting flour is small, and the quantity of flour produced quality is higher [1]. In all cases the quality of the beans before grinding conditioning depends on the performance of technical equipment used [2].

2. Materials and methods

Experiments were performed with the

same species of wheat (wheat - *Triticum vulgare*) grain reddish or yellowish, oval, with long beards and visible. Wheat cultivar was Apulum that, from the point of view of grading, falling within Class A, Group I, weight per storage volume greater than 75, the amount of impurities of less than 6% and less than 15% moisture.

Experimental research method is shown in Figure 1, which shows that the conditioning of wheat before milling was performed in two technologies, characterized by different quality technical equipment performance. Version II includes modern equipment, automation levels higher than the version I [6].

For each variant were collected six samples of wheat, so before I step of peeling and and after primary humidification and application of the second step of peeling.

Before of the grinding was done finishing humidification.

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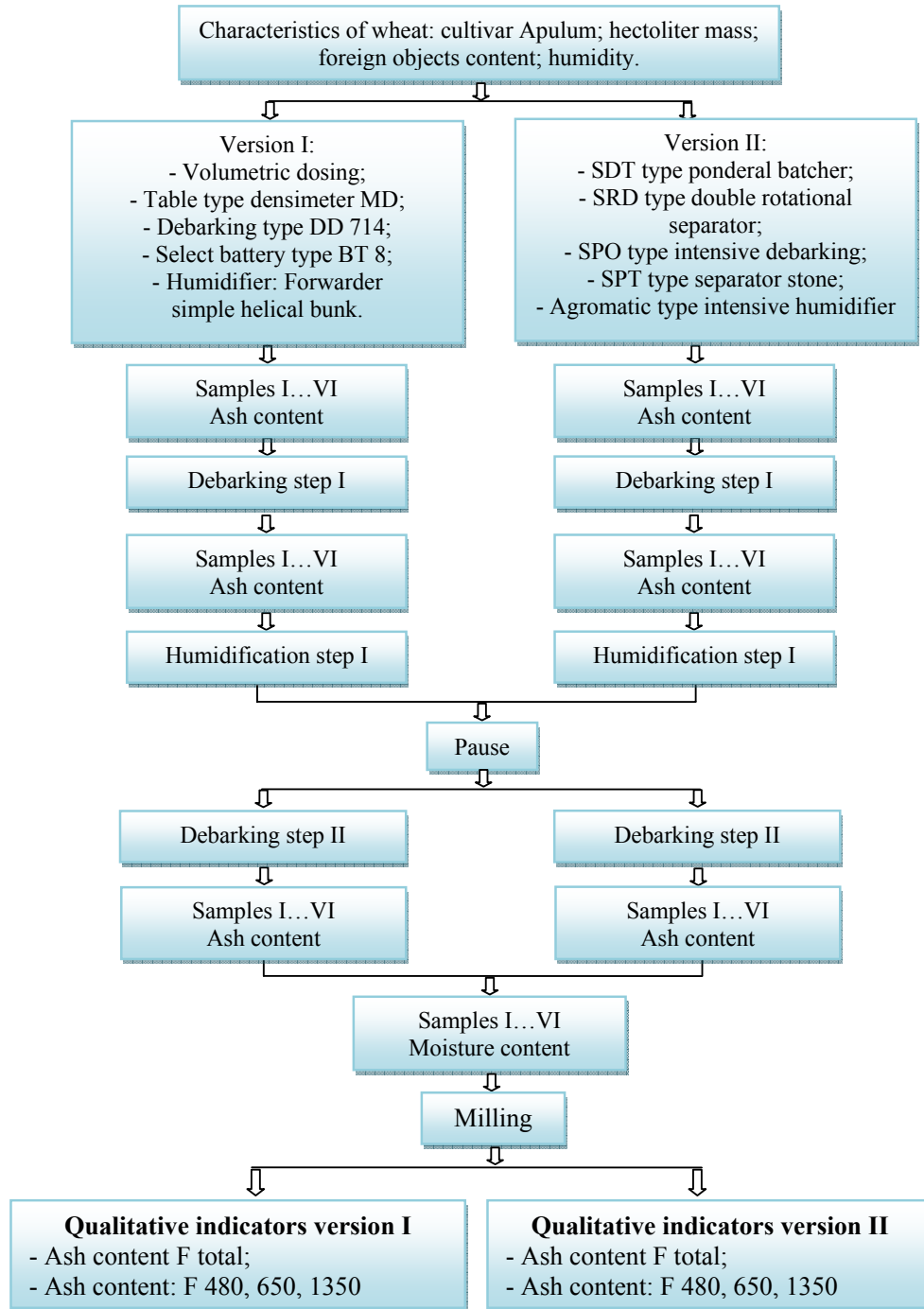


Fig. 1. *Experimental research methodology Foreign objects content in the mass of wheat*

Table 1
Foreign objects in the mass content of wheat, after cleaning, in the two versions

Version I Sample	Bruto foreign objects, %	Neto foreign objects, %	Version II Sample	Bruto foreign objects, %	Neto foreign objects, %
A1	2.04	1.1	B1	2.0	0.3
A2	1.8	0.9	B2	1.7	0.2
A3	1.5	0.8	B3	1.5	0.1
A4	1.5	0.8	B4	1.5	0.1
A5	1.8	0.9	B5	1.8	0.2
A6	1.7	0.9	B6	1.3	0.1

The ash content was determined for each variant technology, both before peeling I and before peeling II, after grinding and the flour total or meal types F 480, F 650 and F 1350.

Samples were taken at the entrance to the station dry cleaning during conditioning, and before grinding.

3. Results and Discussions

The first pursued aspect was the quantity of foreign objects in mass of wheat.

The results obtained are shown in Table 1 and Figures 2 and 3.

As can be seen from Figure 2, the content of foreign objects in wheat mass into dry cleaning, was approximately equal for all pairs of investigated samples.

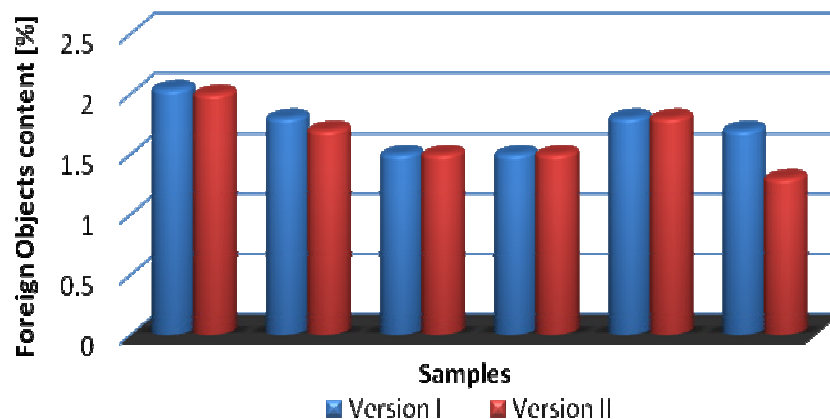


Fig. 2. *Quantity variation of foreign objects entering of the dry cleaning*

Figure 3 is evidenced foreign objects content in wheat mass output of dry cleaning.

As can be seen, the differences between the pairs of samples studied is apparent,

there are differences in the range of 0.7 ... 0.8% by mass of foreign objects can be explained by the superior performance of the equipment used in the version II.

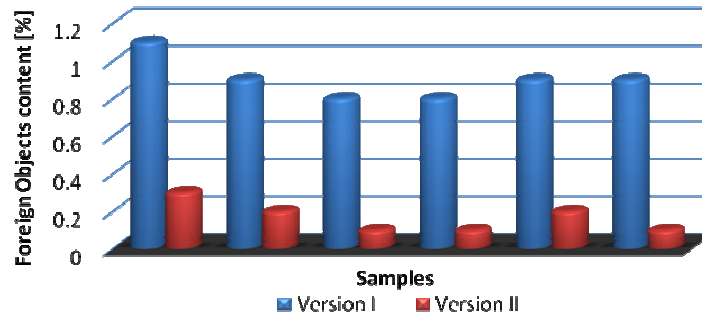


Fig. 3. Quantity variation of foreign objects out of the dry cleaning

One particularly important clue to which great attention was the amount of ash before and after each step of peeling. Thus, by varying the amount of ash by peeling the first step of 6 pairs of samples

studied is presented in Table 2 and graphically in Figure 4.

Arithmetic average decrease in total ash content of the 6 pairs of samples investigated for the two variants considered is presented in Figure 5.

Decrease of ash after 1 step of peeling

Table 2

Version I Sample	Entrance, %	Exit, %	Decreased ash content, %	Version II Sample	Entrance, %	Exit, %	Decreased ash content, %
A1	1.97	1.93	0.03	B1	1.91	1.85	0.06
A2	1.93	1.91	0.02	B2	1.91	1.86	0.05
A3	1.94	1.92	0.02	B3	1.9	1.82	0.08
A4	1.97	1.96	0.01	B4	1.85	1.8	0.05
A5	2.05	2.03	0.02	B5	1.87	1.8	0.07
A6	2	1.98	0.02	B6	1.79	1.74	0.05

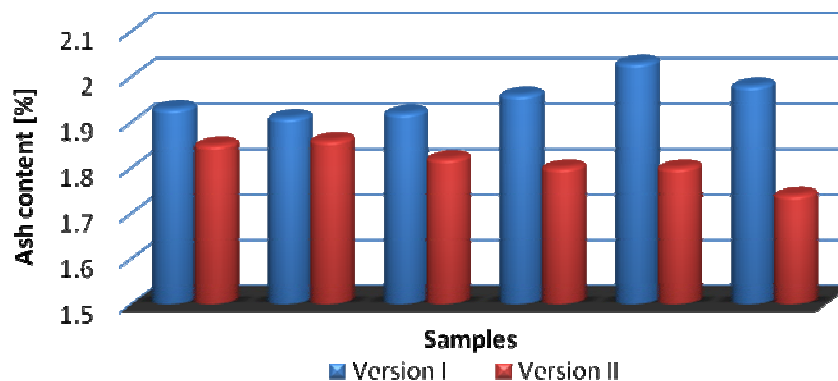


Fig. 4. Changes in the quantity of ash after 1 step peeling

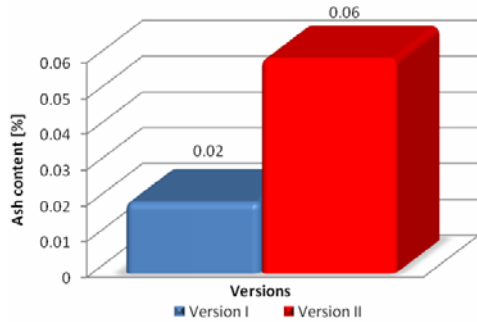


Fig. 5. Mean decrease of ash after I step of peeling

Following the measurements and data processing can be seen as follows:

- the amount of ash mass wheat version I went to the entrance to the debarker for each sample under study between 1.93 ... 2.05%;
- the amount of ash mass wheat version II entry into descojitor varied for each sample under study between 1.79 ... 1.91%;

- the amount of ash mass wheat version I went out of debarking for each sample studied between 1.91 ... 2.03%;
- the amount of ash mass wheat version II out of debarking varied for each sample studied between 1.93 ... 2.05%;
- pronounced decrease in the amount of ash in the I step peeling of II variant for each period considered;
- quantity of ash mass wheat version II out of debarking varied for each sample studied between 1.93 ... 2.05%;
- average the quantity of ash fall using technical equipment variant I is 0.02%;
- the average amount of decrease in the quantity of ash in the case of the variant II equipment using 0.06%.
- variation the quantity of ash after the II step of peeling of the 6 samples is given in Table 3 and graphically in Figure 6. The decrease in the average value of the ash content after step II is presented in Figure 7.

Mean decrease of ash after II step of peeling

Table 3

Version I Sample	Entrance, %	Exit, %	Decreased ash content, %	Version II Sample	Entrance, %	Exit, %	Decreased ash content, %
A1	1.92	1.9	0.02	B1	1.84	1.8	0.04
A2	1.89	1.88	0.01	B2	1.84	1.79	0.05
A3	1.91	1.89	0.02	B3	1.79	1.75	0.04
A4	1.94	1.92	0.02	B4	1.79	1.75	0.04
A5	2.00	1.99	0.01	B5	1.77	1.74	0.03
A6	1.96	1.94	0.02	B6	1.72	1.68	0.04

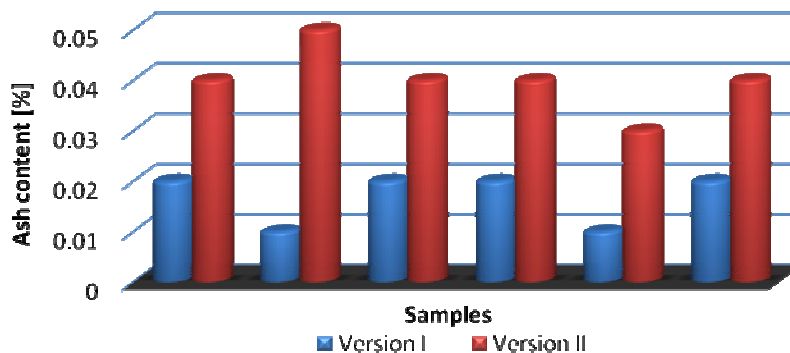


Fig. 6. Changes in the quantity of ash after II step peeling

Following the measurements and data processing can be seen as follows:

- ash content of wheat variant mass I went to the entrance to the debarker for each sample analyzed between 1.89 ... 2.00%;
- ash content of wheat mass II variant into debarking varied for each sample analyzed study 1.72 ... 1.84%;
- ash content of the grain mass in the version I went out of descojitor for each sample studied between 1.88 ... 1.99%;
- ash content of the grain mass in the version II went out of the debarking for each sample studied between 1.68 ... 1.80%;

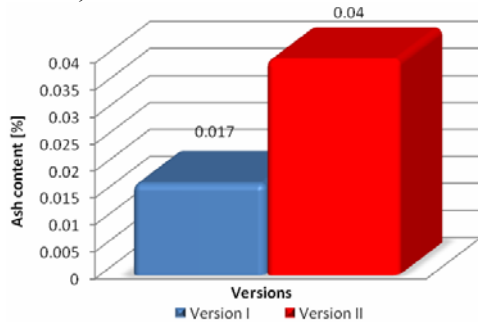


Fig. 7. Mean decrease of ash after II step of peeling

- sharp decline of ash after step I of peel for variant II for each sample studied;
- a decrease in the average content of ash in the case of using the equipment in variant I is 0.017%;
- a decrease in the average content of ash in the case of using the equipment of the variant II is 0.04%.

3. Conclusions

Analyzing the results of Tables 1-3 and Figure 2-7 highlights the following:

- removal foreign objects from the mass of wheat was made more efficient through the use of technical equipment variant II, when foreign objects wheat neto content varied between 0.1-0.3% compared to the

version I use equipment when the same content of Foreign objects wheat fluctuated between 0.8 and 1.1% neto;

- pronounced decrease of the percentage of neto Foreign objects of wheat improve the quality of finished products;

- decrease of ash after the first stage of peeling an average of 0.06% for the II version;

- decrease of ash after the first stage of peeling an average of 0.02% for the variant I;

- a decrease in the ash content as the second step of peeling an average of 0.04% for the II version;

- a decrease in the ash content as the second step of peeling an average of 0.017% to the II version.

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