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PHYSICAL QUALITY OF POTATO VARIETIES (SOLANUM TUBEROSUM L.)

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ABSTRACT

Ten potato varieties were studied for firmness of raw tubers and texture of the boiled product. Textural properties of selected varieties of potatoes were evaluated using unaxial compression test on a device Tira test 27025. Cylindrical specimens of the exact size were prepared from raw and boiled potatoes. The force needed for compression was recorded and assessed.

In raw potatoes the varieties with the biggest hardness was variety Red Anna (201,2 N), Keřkovské rohlíčky (186,5 N) or Korela (186,2 N). The variety Jitka needed only the force of 133,5 N to be compressed.
The most hard boiled potatoes was the varieties Rosara (12,0 N) and Ditta (11,3 N). Both of them are classed to cooking type AB. Minimal force for compression needed the variety Katka (3,8 N) which is cooking type BC. According to the results of the tests there is evident relation between the cooking type and hardness of boiled potatoes. It is valuable and could help us to observe some planting conditions, like physiological maturity in relation of potato quality for consumers.

INTRODUCTION

Texture of potatoes is qualitatively and economically important factor. According to the texture of boiled tuber are potatoes divided into various cooking types such as salads (A), multi-purpose (B) or floury (C), including transitional groups. It is based on disintegration, consistency, mealiness, dryness and structure. These are determined particularly by the starch content. Human perception of the texture may be imitated by instrumental methods in several forms such as chewing or biting. Now, there are identified some differentials in texture parameter during potato storage. Some varieties through the storage have different cooking type at the storage opening distinct of ending (SOLOMON, JINDAL, 2007). These used methods are accurate, repeatable and representative. It is also possible to investigate the relationship between the texture of raw and cooked potatoes.

MATERIAL AND METHOD

Potatoes *Solanum tuberosum L*. of the varieties Aneta, Ditta, Jitka, Karin, Katka, Keřkovské rohlíčky, Korela, Lolita, Red Anne and Rosara were used as the experimental material. The crop was from the School Farm in Žabčice which was harvested in September 2007. These varieties were including various cooking types of the potatoes ranging from the A to B and C type commonly used in Czech gastronomy. The tubers were stored under controlled conditions before the analysis. For testing the medium size tuber were used.
The laboratory device Tira test 27025 was used for evaluating the texture of potatoes. Cylindrical samples were prepared from raw tubers from the medium part of the tuber and not from the vascular ring using cork borer no.12 (diameter 12 mm, height 10 mm).

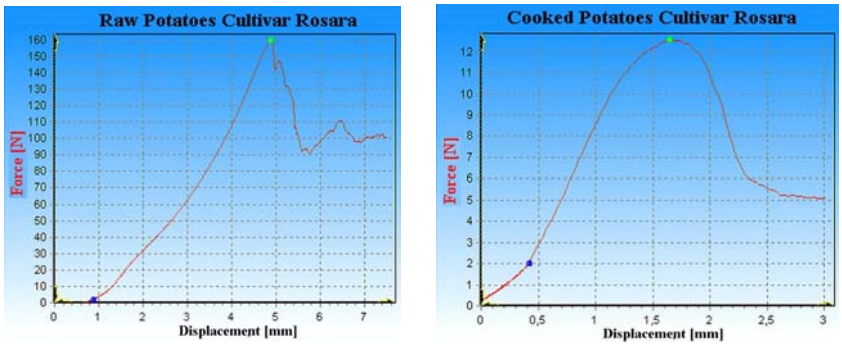

Figure 1
Force/displacement curves recorded
during Rosara specimen unaxial compression test

Raw samples were cooked in the distilled water for a period of 7 minutes. There were 50 specimens in the series. For evaluating of the texture was used uniaxial compression test. Raw samples was compressed between two steel plates to 75 % of its original height, cooked one to 30 %. The loading rate was 50 mm per minute. The dependance of the force on the time of compression was recorded (Fig.1). The hardness of the tubers of different varieties was compared and statistically evaluated (Unistat 5.1).

RESULTS

The classification by varieties was significant factor influencing the force needed for compression of the sample. There were statistically significantly differences of the hardness between potato varieties. In raw potatoes the varieties with the biggest hardness was variety Red Anna, Keřkovské rohlíčky or Korela. The variety Jitka needed only the force of 133,5 N to be compressed.
The most hard boiled potatoes was the varieties Rosara and Ditta. Both of them are classed to cooking type AB. Minimal force for compression needed the variety Katka, which is cooking type BC. Generally there was no dependance of raw potato texture on the cooking type. But concerning cooked potatoes hardness it was found that less hard are cooking type BC and B while for cooking type AB force increased.

DISCUSSION AND CONCLUSION

Potato tuber is heterogeneous material and specimens varied a lot. The variation is larger for cooked samples than for raw potatoes, according to THYBO, VAN DEN BERG (2002). The findings of this study illustrate obvious differences between textural properties of potato varieties. It is not only the variety what is the important influence. For example it was investigated by NUNN et al. (2006) that some vegetables had different values of texture score depending on type of boiling. Important influences are also the soil, a fertilizers or weather condition. But only with real values we can compare sufficiently different groups of specimens under various conditions (SOLOMON, JINDAL, 2007). Next our research will concentrate on these external influences on the texture of the potatoes. Our aim is to create useful database which would characterize each potato variety by texture and other analyses.

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NON-DESTRUCTIVE SORTING OF POTATOES

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ABSTRACT

The internal quality of potatoes and other vegetables and fruits is an important quality factor for both consumers and food industry. There are several diseases and defects, which have no effect to the quality of potato skin. Therefore internal defects remain invisible to human and also to ordinary camera.