At dilution by water tightness and weight fraction of neutral fat is reduced. It is considered to be that tightness of milk decreased approximately on 3 kg/m^3 on each ten percent of added water. For natural milk tightness is 1029 kg/m^3. Removing of cream or dilution by skim milk (which tightness make up 1033 - 10.35 kg/m^3) caused by rise of tightness. Change of milk density also caused by various diseases of animals, for example mastitis.
Thus, on base of received results was established that physicochemical parameters can variety under the influence of various factors (phase of lactation, diseases of animals, etc.), and also at milk falsification. Therefore their definition allows estimating of naturalness, quality and suitability of milk to processing in different dairy products.

PHYSICAL CHARACTERISTICS OF SEA BUCKTHORN BERRIES GROWN IN 2007

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ABSTRACT

Sea buckthorn (*Hippophae rhamnoides* L.) is a native bush to Europe and Asia that produces orange to yellow berries. Its berries have a wide range of uses in medicine and also in food industry.
Harvested sea buckthorn berries proceed to several processing operations which all emphasize knowing all the necessary data about their physical properties like size, shape, weight, moisture content and firmness.
Size and shape showing the uniformity are important features to achieve the highest level of efficiency in processing. Moisture content refers to the juicy of the berries. Force and energy required to rupture the sea buckthorn berries depend on several factors as the strength of the skin, the firmness of the flesh, the viscosity of the juice, the turgid pressure, and the size of the fruit.

INTRODUCTION

Sea buckthorn (*Hippophae rhamnoides*) is native to Eurasia and the plant is noted for its impressive range of uses: for soil conservation, as an ornamental, in the tea industry, and especially as a fruit, which is rich in vitamin C and other nutritional and bioactive compounds (Tang, 2000).

The aim of this work was to determine physical characteristics like size, weight, firmness and moisture content of sea buckthorn berries grown in Estonia in 2007.
The properties of berry vary within the species and therefore the present study concentrates on measuring the physical characteristics of eleven different species of sea buckthorn berries.

MATERIALS AND METHODS

In 2007 several species of sea buckthorn berries grown in Estonia were gathered and analyzed: Avgustinka (AVR), Botanitseskaja (BOR), Botanitseskaja Aromatnaja (BOA), Botanitseskaja Ljubitelskaja (BOL), Gibrid Pertsika (HPR), Hergo (HER), Otradnaja (OTR), Podarok Sadu (PSR), Sirola (SIR), Trofimovskaja (TRR) and Vorobjevskaja (VOR). Most species are from Russia, HER and SIR from Germany.

1. Berry size and weight

Berry size was determined measuring berry basic parameters like width, length and thickness with a micrometer. Amount of berries taken under measurement was 30. Berry shape was calculated and presented as geometric mean diameter D_g (Mohsenin, 1970):

$$D_g = (LWT)^{\frac{1}{3}}$$

For calculating sphericity (Φ) the following equation was used (Mohsenin, 1986):

$$\Phi = \left(\frac{(LWT)^{\frac{1}{3}}}{L} \right) \cdot 100$$ where L is length, W width and T thickness.

Weight was measured with analytical balance as the weight of 30 berries.

2. Berry firmness

Firmness was measured with texture analyzer TA- XT2i (Stable Micro Systems, UK) which evaluates the force required to rupture the sea buckthorn berry. For each test, a single berry was placed onto the plate and compressed with the probe. Experiment was repeated up to 40 berries.

3. Berry moisture content

To measure the berry moisture content the berry had to be comminuted to increase the efficiency and accuracy of results. The procedure was repeated three

to four times using halogen moisture- analyzer Mettler Toledo HR83 (Mettler Toledo, Switzerland).

RESULTS AND DISCUSSION

1.Berry size and weight

Berry size, weight and sphericity vary between different sea buckthorn species, but disparity is not so significant. BOR has the highest parameters: width, length and thickness 9,33mm, 11,92mm and 9,33mm, respectively. The smallest berry is HER with width 6,51mm, length 8,40mm and thickness 6,51mm. Geometric mean diameter is according to size parameters greatest for BOR and smallest for HER.
About weight, as can be found according to size parameters, BOR is the heaviest and HER is the lightest.
Sphericity as the measure of dimensions for products, which do not have an exactly defined geometric form (Alfonso, 2007), reveal that sphericity does not depend on the weight nor geometric mean diameter. The heaviest and the biggest berry in the present study is BOR, but it does not have the highest value of sphericity, PSR does, 84,9 and 85,0%, respectively. Lightest and the smalles berry is HER, which sphericity is 84,4%, is one of the roundest berry under the observation. BOL and VOR both have the lowest value of sphericity, which is 76,5%.

2. Berry firmness and moisture content

The minimum values of firmness are not differing significantly staying around 117g, except HER which minimum firmness 162g. BOR and VOR maximum firmness is lower than other species around 256g, while the rest are similar to the average maximum value of 350g.
Berry moisture content refers that moisture content in sea buckthorn berry is from 81,26% to 86,87%, averagely and differs by species. AVR has the highest moisture content reaching to 86,87%. On the other hand, HPR moisture content is only 81,26%.

Discussion

The study revealed that Russian originated sea buckthorn berries are slightly bigger than German species HER and SIR which are one of the smallest berries under the research.

The widest berry is BOR- 9,33mm, the longest is HPR- 12,44mm and the thickest is also BOR- 9,33mm, which has also the greatest geometric mean diameter 10,12mm. The smallest berry among the others is HER, which width, length and thickness are 6,51mm, 8,40mm and 6,51mm, respectively. Generally, length of berries studied in the present research is between 8,40 and 12,44mm, width and thickness are in range of 6,51- 9,33mm. Compared to results from scientific literature of sea buckthorn berries grown in Estonia in 2006, the berries have gone slightly shorter and thinner. In 2006 berry length was from 10,64 to 13,71mm, width and thickness from 7,79 to 9,03mm.

Weight of berry in the present study was between 0,30 and 0,73g, where the lightest berry was HER and the heaviest BOR, respectively. Compared to data from the year of 2006 when the weight of the berry was 0,49 to 0,85g, which is higher value than the present berries have.

Sphericity of sea buckthorn berries in the present study is between 76,5 and 85,0%,

BOL and VOR both have the lowest sphericity, PSR has the highest value of sphericity, respectively.

Firmness of berry depends on strength of the skin, the firmness of the flesh, the viscosity of the juice, the turgid pressure of the fruit and the size of the fruit (Khazaei, 2004) and that may be the reason why HER with the most discreet proportions, shows the highest firmness value which ranged from 162,06 to 374,51g. BOR which was the biggest berry, shows firmness from 106,81 to 256,13g. Generally, the firmness was between 154,67 and 282,21g, averagely.

Observing the results of the present study and Graphic 1, it can be said that there is a dependence between the geometric mean diameter and firmness of the berry. The smaller the berry geometric mean diameter is, the higher firmness value it has.

Moisture content in analyzed berries was in the range from 81,26 to 86,87%. The highest moisture content was in AVR and the lowest in HPR. Average moisture content taken all species and samples into consideration was 83,10%. Compared to results of year 2006, moisture content has decreased from the level 84,9% to 83,10%.

The present research shows that sea buckthorn berries have different physical characteristics depending on the variety of species and through years.

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APPLICATION OF TEXTURE ANALYZER IN THE QUALITY ANALYSIS OF BAKERY PRODUCTS

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INTRODUCTION

Bread is a basic foodstuff for the Center European people. There are several traditions on bread making in Hungary but the consumers and the industrial bread production requires a stable product quality. Because of the different quality parameters of the applied flours several additives used in production to stabilize bread quality, both in taste and texture.

Texture analysis is primarily concerned with the evaluation of mechanical characteristics where a material is subjected to a controlled force from which a deformation curve of its response is generated. These mechanical characteristics in food can be further sub-divided into primary and secondary sensory characteristics which have proven to be correlated to sensory perception. The primary characteristics parameters are the hardness, springness, adhesiveness and cohesiveness (Figure 1.) (Szczesniak et al (1963). Bourne (1978))

Texture analysis is an objective physical examination of baked products and gives direct information on the product quality, oppositely to dough rheology tests what are inform on the baking suitability of the flour, as raw material (Baik and Chinachoti, 2000; Charson and Sun, 2001; Szczesniak, 2002). This is why the texture analysis is one of the most helpful analytical methods of the product