THE RESEARCH OF THE EMULGATING ABILITY OF THE CHIA SEEDS MEAL PELLETS AND PSYLLIUM CELLULAR TISSUE AND THE ENDURANCE OF THE EMULSIONS BASED ON THEM

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Because of the fast life movement the demand of the frozen food products has been highly increasing at the Ukrainian food market. The main part of the frozen goods at the market is occupied with ground meat semi-cooked products. The cahges, which can negatively influence the final product, are happening during the freezing process. The grain formation, which is taking place during the freezing process can go with muscular fibers breaking down, protein disintegration, meat drying up, that influence the technological features of the frozen materials [1].

The conducted analysis of the literature sources let us claim about the necessity & the perspective of using of the food ingredients in the body of the frozen meat ground semi-cooked products. It is known that the molecules of polysaccharides are the chains rolled in a ball, which in case of getting into the water or in the surrounding, containing free wet, can unroll, thereby restricting the moving ability of the water molecules. It comes to the increasing of the solution viscosity [2].

The methods of the research. The emulsion stability (ES) has been found with the heating it under the temperature of 80^{o} C during 30 min and the cooling with the water during 15 min. Then four laboratory centrifugal test-tubes were filled with the emulsion, which are calibrated, housed 50 sm^3 and centrifuged under the turning frequency 500 c^{-1} during 5 min. Afterwards the volume of the emulsified ball was defined.

The emulsion stability, %:

$$CE = V_1/V_2 \cdot 100, \quad (1)$$

where V_1 – the volume of the emulsified oil, sm^3;
V_2 – the general volume of the emulsion, sm^3.

The emulgaiting ability (EA) was counted after the compound centrifugalization of the oil, water and emulsion under the turning frequency 500 c^{-1} during 10min. Then the volume of the emulsified oil was defined.

The emulgaiting ability, %:

$$ЕЗ = V_1/V_2 \cdot 100, \quad (2)$$

where V_1 – the volume of the emulsified oil, sm^3;

V_2 – the general volume of the oil, sm^3 [3].

Result discussion. The substantiation of the rational hydration of the chia seeds meal pellets And the hydration of the psyllium cellular tissue were made according to the research of the emulsion stability & the emulgaiting ability (tabl. 1, 2) under the influence of the freezing-unfreezing pocesses and the heating (reached to the temperature 80 ± 2 °C in the centre), taking in to the consideration the production technology of ground semi-cooked products.

For the research the rational concentrations of the gel of the chia seeds meal pellets and the cellular tissue gels, which are (1:10, 1:15,1:20, 1:25) and (1:35, 1 :1,40, 1:45, 1:50) consequently, have been chosen.

Table 1 –The figures of the emulsion stability and the emulgaiting ability of the chia seeds meal pellets.

Recipe	EA,%	ES,%
Chia seeds: water – 1:10	42	34
Chia seeds: water – 1:15	38	31
Chia seeds: water – 1:20	34	29
Chia seeds: water – 1:25	32	26
With freezing in thickness till -18° C		
Chia seeds: water – 1:10	52	38
Chia seeds: water – 1:15	44	37
Chia seeds: water – 1:20	38	34
Chia seeds: water – 1:25	36	33
With warming (under 80 ± 2 °C)		
Chia seeds: water – 1:10	44	35
Chia seeds: water – 1:15	40	34
Chia seeds: water – 1:20	38	31
Chia seeds: water – 1:25	34	30

The chia seeds meal pellets emulsions in the hydration (1 : 25) showed 23-24 % less figures of EA and ES , in comparison with samles in the hydration 1 : 10. But, the figures, taken for these emulsions, are high enough to state about high emulgation ability of the chia seeds meal pellets. The increased concentration gel of the chia seeds meal pellets positively influences the characteristics of EA and ES, which have the tendency to increase. The freezing-unfreezing pocesses and the heating influences well to the gels. The highest increasing of these figures is watched after the freezing-unfreezing pocesses. The created gels become denser in comparison with the sample before freezing. The figures of EA samples with the concentrations after freezing 1:10 showed 23% higher markers before freezing.

Table 2 – The figures of the emulsion stability and the emulgaiting ability of the hydrated psyllium cellular tissue (PCT).

Recipe	EA,%	ES,%
PCT: water – 1:35	78	45
PCT: water – 1:40	60	43
PCT: water – 1:45	46	40
PCT: water – 1:50	40	38
With freezing in thickness till -18° C		
PCT: water – 1:35	82	46
PCT: water – 1:40	74	48
PCT: water – 1:45	68	51
PCT: water– 1:50	50	55
With warming (under 80 ± 2 °C)		
PCT: water – 1:35	80	47
PCT: water – 1:40	72	49
PCT: water – 1:45	64	50
PCT: water – 1:50	44	57

The psyllium cellular tissue emulsions during the hydration (1 : 50) showed 48-16% less figures of EA and ES in comparison with the samples in the hydration 1 : 35. But the figures, taken for these emulsions, are high enough to state about high emulgation ability of the psyllium before emulgation. The freezing-unfreezing processes and heating positively influence the psyllium cellular tissue gels. EA in the sample (psyllium cellular tissue: water - 1:35) after freezing increases in comparison with 5,13 % control.

Conclusion. The increasing of the figures of EA and ES after feezing and heating can be explained by using the additives of polysaccharide nature. The data of the research show the prospectivity to use chia seeds gel & psyllium cellular tissue gel in the production of the ground semi-cooked products.

References

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