Properties and application of dietary fibers in meat technologies.

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Abstract - **the functional and technological properties of «Vitacel» wheat cellulose have been researched. More than 40 specific recipes of all meat products have been worked out (composed). The presence and persistency of aroma have been detected by instrumental method at the special device of «electronic nose». It was detected by experimental method that «J. Rettenmaier Soehne GmbH» «Vitacel» injection in technological concentrations does not deteriorate the intensity of coloring of final meat product.**

Key words – **dietary fibers, cellulose.**

Everyday food ration of human must contain, according to the contemporary theory, all established set of nutrients in a necessary quantity and ratio as well as ballast substances. The role of the latter ones in the nutrition of the contemporary human is scientifically based by works of many scientists. In connection with that fact enrichment of ballast substances became wide spread in industrial production of products of bakery and confectionary industry; juices production and beverages and etc. But as for the technologies of meat products there is lack of information and there was a necessity of research in functional and technological properties as well as assessments of influence on the quality of the final product. We were the first in Russia to have conducted the research, and the results were indicated in several dissertation works. We have elaborated 40 recipes for all groups of meat products with «J. Rettenmaier Soehne GmbH» «Vitacel» cellulose: small sausages, pastries, ham. This also includes a sphere of infant's food.

Capillary and fibrous structure of «Vitacel» cellulose of «J. Rettenmaier Soehne GmbH» is proved with conducted research of microstructure analyses. This structure provides a high water retention. It was experimentally proved that products of dietary fibers have a good sorption capacity and high degree of swelling. We will examine the results of influence of «Vitacel» products on color and aroma of final meat product.

The tests were made on standardized meal selection: main raw materials (beef of the highest sort, low-fat pork); products of wheat cellulose of «Vitacel» (WF200, WF400, WF600) – manufacturer «J. Rettenmaier Soehne GmbH» Germany, meat products, manufactured according to the elaborated recipes. The presence and persistency of aroma in the model samples have been detected by instrumental method at the special device of "electronic nose" (Y.I. Korenman, T.A. Kuchmenko, 2002); The color characteristics were indicated in colorimetric system of CIE L* a*b* and XYZ according to the specters of reflection on spectrophotometer SF-18.

Color characteristics of model samples of sausages with «Vitacel» wheat cellulose.

Table 1

№	Share of additive injection, %	Color characteristics						
		chromaticity color		$l_{declination}$	L*	a*	b*	S
		X	Y					
1	0	0.3466	0.3115	0.00000	45.58	18.07	8.14	19.81
2	2	0.3462	0.3117	0.00044	46.95	18.11	8.26	19.90
3	4	0.3437	0.3121	0.00294	47.13	17.75	8.37	19.62
4	6	0.3424	0.3122	0.00425	47.24	17.69	8.63	19.68
5	8	0.3409	0.3126	0.00581	48.27	17.17	8.71	19.25
6	10	0.3401	0.3129	0.00665	49.12	17.12	8.65	19.35

Differences between reflection specters of the control sample and a sample with 10% of wheat cellulose of «Vitacel» are not big enough and make R=0.05-0.07. Maximum differences in chromaticity make 1 declination= 0.00828 and E= 3. 65. Dependence of chromaticity changing has a linear character. Along with increasing injection of «Vitacel» wheat cellulose the brightness(L*) of the product is also increasing by 0.75 and the term a* is decreasing by 0.92, that characterizes the redness of the sample. This means, the product loses its pink coloring and obtains brighter coloring. The term b*, that characterizes yellowness of the product, doesn't change. That means that «Vitacel» additive doesn't change the color of the product, just dilutes color a little. It was experimentally

proved that injection of the additive in this concentration doesn`t worsen intensity of the product color, that is indicated in practice by almost constant brightness of the product S.

As a result, «Vitacel» in concentrations of 4-6% doesn`t change largely color and doesn`t need its correction.

Technological standards of «Vitacel» addition into meat products as a rule don`t exceed more than 3%. This means that even under its maximum addition the human eye doesn't notice decoloration.

According to the results of research of aroma persistence of minced meat with using of wheat cellulose of «Vitacel» WF 200 there was created a diagram of aroma changing of minced meat models depending on the duration of storing with a glance of mass share in minced meat of the researched product (figure 1).

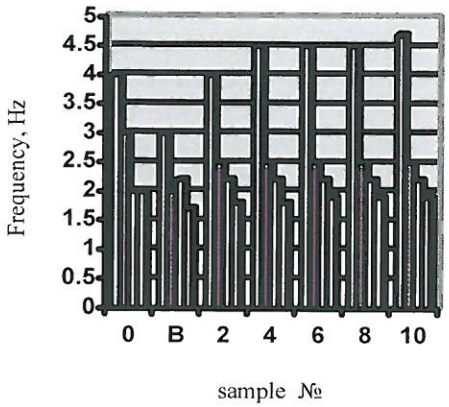
Results of experimental research on aroma persistence of model minced meat with using cellulose show that «Vitacel WF200» wheat cellulose, using as a compound part of meat products recipes provides preserving the aroma during a long period of storing time.

Hundreds of Russian manufactures of meat production use «Vitacel» with great success in all groups of meat products starting from half cooked products to dried and smoked small sausages.

ACKNOWLEDGEMENT

We express our Gratitude to President of «Intermik» holding Mr. Piotr Miklaszewski.

Figure 1



On figure № 1 – Changing of sorption of aromatic substances of model minced meat from storing duration: 0- model minced meat, B- «Vitacel» (100%); 2- model minced meat +2 % «Vitacel»; 4- model minced meat +4% «Vitacel», 6.- model minced meat +6% «Vitacel» in exchange of main raw materials: 8- model minced meat + 8% «Vitacel»; 10- model minced meat + 10% «Vitacel».