

Laboratory of microstructural researches of meat products

In process of accumulation of knowledge of meat there was a new direction in a science – «the Microstructure of meat and meat products». This section has separated from the general histology in connection with physiological features of a muscular fabric, after technological influence according to specificity of the meat industry. New methodological approaches to selection and processing of a material for carrying out of the adequate analysis were required. The purpose of it is studying of quality of raw materials and products at their technological processing and storage (a microstructure of meat and meat products). In 1974 at the All-Russia scientific research institute of the meat industry laboratory «meat Microstructure» in which have been introduced besides classical both new histochemical and ultrastructural methods of research has been created. A.A.Belousov was the first head of laboratory. Later the control-analytical laboratory and a vivarium has been included in its structure. The laboratory has received the name «the Microstructure and meat chemistry» and till 1987 by Belousov A.A was headed. Since 1987 and till the present day manager is Hvylya S.I. In 2000 the chemical group has been deduced from laboratory in the certified center. Later on the basis of a vivarium «the Experimental clinic-laboratory of biologically active substances of an animal origin» is created.

Last years the laboratory is substantially re-equipped by the newest equipment of leading world firms. Thus work with the equipment is spent by means of author's updatings of the methods considerably raising efficiency of researches and quality of materials for the microstructural analysis.

Now following kinds of researches are spent to laboratories:

- Working out of histologic methods of definition of the maintenance of a muscular fabric in meat semifinished products and lumpy products from meat;
- Definition of quality and an estimation of periods of storage of the frozen meat raw materials on histologic indicators, studying of influence of long refrigerating storage on a microstructure of the frozen meat raw materials;
- Studying of change of immunochemical characteristics of the muscular fabric, occurring in the course of technological processing of meat raw materials;
- Studying of morphological features of a muscular fabric of different kinds of lethal animals depending on localization in various cuts;
- Definition of microstructural features of loose products for the meat industry at different technological variants of processing (unicomponent food additives; complex food additives; vegetative albuminous products; dried milk and dry products of processing of milk; dry egg products; animal protein).

Scientific and industrial achievements of laboratory:

1. Influence of structure of meat on quality of developed products has been established, microstructural changes in a course meat PSE, NOR, DFD are studied. Communication between structural features of meat raw materials and its changes in technological process, such as meat freezing, the ambassador and thermal processing, massaging of meat raw materials, is studied character of structurization of sausages is defined. Dynamics of the processes occurring in meat and offal from a surface of the sample deep into and leading to decrease of its freshness is studied. Histologic methods of identification of components of a phytogenesis of the albuminous and carbohydrate nature in meat raw materials and ready products are developed and dynamics of change of a microstructure of these components is investigated during technological processing of a product. The indicators limiting distribution in meat of entered vegetative components, such as, the sizes of particles of vegetative components, morphological features of meat – characteristics connective tissue layers, a thickness and degree of friability of intercellular substance, expressiveness of changes of structure of muscular and connecting fabrics after technological influences are revealed.
2. Morphological features of farina in different kinds of the plants used in the meat industry which allow to spend their differentiation depending on a kind of a vegetative source are established.
3. During researches on application of a histologic method the technique has been developed for the analysis of powdery additives.
4. The comparative analysis of meat and meat products on detection of a myoglobin and its maintenance in different structures of a product is carried out. The classical technique of definition of a myoglobin for the purpose of reception a contrast histologic preparation has been for this purpose advanced. It is established that in samples that at the technological processing were exposed to thin crushing and haven't kept morphological signs of muscular fibres, it is impossible to identify quantity of a muscular fabric on a myoglobin. By means of a method of the computer analysis of the image it is possible semiquantitative method to define dependence between presence of a myoglobin and the actual maintenance of a muscular fabric.
5. Development of quantitative methods of an estimation by means of a histologic method is spent at application of computer systems of the analysis of the image for definition of the size of particles (quantitative morphological analysis) the crushed meat raw materials and the meat products which are difficult multicomponent systems. On this basis the methodical base of use of histologic methods in the meat industry should be expanded, at certification of meat raw materials, semifinished products and ready products.

6. Histologic indicators of the frozen meat raw materials of long refrigerating storage which allow estimating its quality objectively are defined.

Our clients: Histologic laboratories of meat-processing plants, and also laboratory of the state and industrial veterinary and certified services.

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