

THE DRYING KINETICS OF RAW SMOKED SAUSAGES FROM HORSEMEAT

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Abstract – horse meat is rich in many valuable substances, including amino acids, vitamins and minerals. The amino acid balance of protein horsemeat is not inferior beef. Meat of horses contains almost no cholesterol. Scientists Research Institute for processing and food industries has developed technology to produce smoked sausages of horse meat. To carry out the drying process designed drying chamber and a device for the maintenance and control of relative humidity of air at the same time measuring the water activity of meat products. To study the activity of water in the drying process developed a device that measures the amount of water activity in the sausages as they dried. Was defined kinetic dependence of measurement of weight of sausages from a horse-flesh in the course of drying.

Key Words – activities of water, relative humidity of air, drying camera, drying process, sausage products

I. INTRODUCTION

Now in Kazakhstan in all categories of economy is more than 1 million goals of horses. The productive horse breeding has got a great value, having reserves of increase in meat and dairy efficiency for satisfaction of population requirement in foodstuff.

The world production of such fine delicacy as the horseflesh, makes over 1035 thousand tons a year. The leader in this direction is Mexico which makes over 143 thousand tons of a horseflesh a year, on the second place – China (over 126 thousand tons a year). Our republic takes the third place in this list, making over 114 thousand tons a year. However, Kazakhstan – is the unique country in the world where such breeds of horses, as kushumskaya, mugalzarsky and kabinskaya are created. These horses are deduced specially for manufacture of high-quality horseflesh and mare's milk. They are grown up year-round on pastures where consume various grasses. Grown up in herd

conditions animals the forage in which pesticides contain, doesn't demand some fertilizer, therefore their meat is ecologically pure. The horse isn't ill a pearl disease, barbs, the cow furiousness. As a result their meat, besides ecological cleanliness, unique differs flavoring qualities.

The horse meat is richly many valuable substances, in particular amino acids, vitamins (A, groups B, E and PP) and minerals (phosphorus, sodium, copper, ferrum, potassium, magnesium). Protein level in a horsemeat reaches 24,5 %, in beef and veal -20,59 and 19,86 % accordingly. On amino-acid equation of squirrels of horsemeat doesn't concede to beef. On microelement structure the horsemeat is close to beef, but more ferrum and the copper participating in process of blood-making that serves as the positive factor at treatment and anemia preventive maintenance contains. The horsemeat also surpasses other kinds of meat raw materials used for manufacture of meat products of a functional purpose under the maintenance of potassium, vitamins A, I, B1, B2 [1]. This product is dietary and digestible: if beef is digested in an organism within days, a horse-flesh - just for 3 hours. The horsemeat practically doesn't contain some cholesterol, possesses anti-sclerotic effect and beneficial effects on metabolism. It is recommended to use to improve the digestive system and the state of the intestinal micro flora.

However, the meat-packing plants currently produce products made of horse meat in small quantities, because of the limitations of science-based technologies for the integrated use of horse meat for sausage.

II. MATERIALS AND METHODS

In this regard, scientists of the research institute of processing and food industry has developed a technology of production of smoked sausages made of horse meat.

In Kazakhstan in production of sausage products the annual increase in a share of raw smoked sausage products is observed. The production of these sausages is one of the most difficult areas in the manufacture of meat products, the final step in the development of technology is a dry sausage drying process at which the meat maturation and achievement of the equilibrium moisture content of finished products to store for long term.

For effective carrying out of process of drying it is necessary to create the For the effective conduct of the drying process is necessary to create conditions for the migration of moisture from the inner layers of the product to the surface with a uniform transfer of moisture from the surface of the product into the air, while extremely important is to maintain a gradient of water activity A_w of the product and a relative humidity of air ϕ at constant temperature and velocity of its circulation of air in the drying camera.

III. RESULTS AND DISCUSSION

To carry out the drying process of sausages made of horse meat we designed and built drying chamber and a device for maintaining and regulating the relative humidity of air. To investigate the activity of water developed sensors that measure the surface temperature of sausage sticks for drying them. The quantity of water activity was determined by the method described in the literature [2].

Fig.1 The dependence of the kinetic mass of sausages produced in the drying process of the horse.

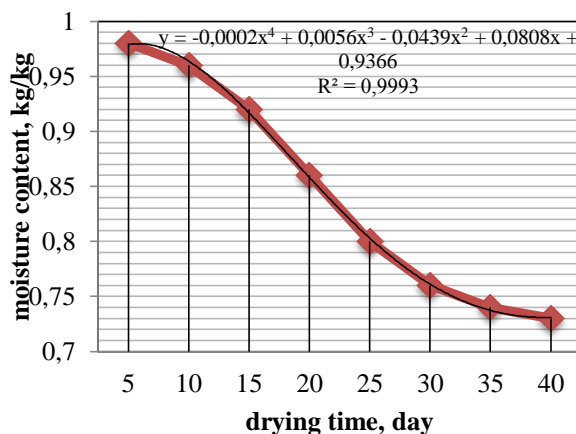


Fig.1 Weight loss of raw smoked sausage from horsemeat

The moisture content of sausages was determined at the beginning and end of the drying process. For ease of comparison of the

values determined by moisture content and weight of loaves of representatives in the mathematical relationship in dimensionless form. In this case the initial values taken as one unit.

Fig.2 shows the changes in the value of A_w , and ϕ for drying sausages made of horse meat.

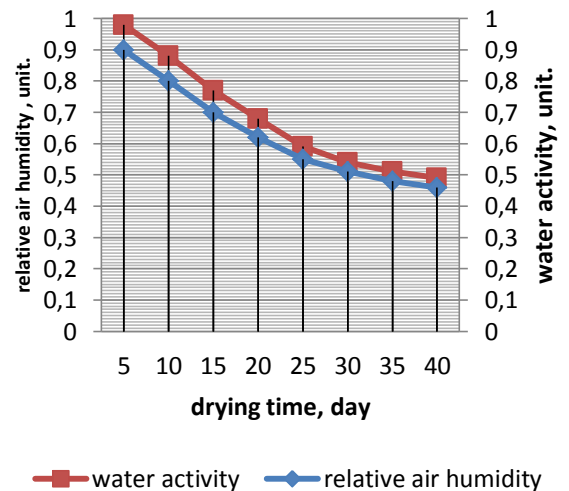


Fig.2 Change of A_w and ϕ when drying raw smoked sausages from horsemeat

The moving force behind the migration of moisture from the inner layers to the surface of the stick is a gradient between the moisture content of the surface and the interior of the loaf. A moving force behind the process of moisture transfer of moisture from the surface of the loaf to the air is a gradient of water activity and relative humidity.

Regulate and maintain the relative humidity in the oven drying sausages and setting the optimum value of the gradient between the water activity of the product and the relative humidity of air maintains optimal drying process and improve product quality.

IV. CONCLUSION

The moving force of the drying process is the gradient of water activity and relative humidity. The measurement of water activity and relative humidity maintains optimal drying and improve product quality.

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