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Conference: 13th AICLST, Kolkata, 6–8 March 2026

Paper reference: TI-107/O

Printed pages: 249–251

Source: *Leather 2050: Challenges & Opportunities*, ILTA (2026)

Recycling of Organic Waste Generated during the

Processing of Kamus Skins Reindeer

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Ref. No. TI-107/O

Key words: kamus skins reindeer, organic waste, recycling, protein hydrolyzate

1. Introduction

The “Small Innovative Company “ECOM” LLC is engaged in processing various types of fur and fur raw materials. The maximum volume (26%) of the processed raw materials falls on the legs of cloven-hoofed wild and domestic animals. The main collagen-containing waste obtained during the processing of kamus skins reindeer is edge cutting (up to 15%) and flesh (up to 7%). They are valuable raw materials for the production of bioactive materials for a wide range of applications. It is of interest to use these types of collagen-containing waste to produce a protein hydrolyzate and to study its physical-chemical, colloid-chemical and structural-rheological properties as well as its amino acid composition.

2. Materials

To obtain the bioactive material the edge cutting of the kamus skins reindeer was used.

Index Value Mass fraction of moisture,%, not more than 26,7 Mass fraction of unbound fatty substances in the skin tissue,%, not more than 1,8

Mass fraction of mineral substances,% not more than 0,4 Mass fraction of nitrogen,% 1,4 Mass fraction of protein,%, not more than 8,9 pH of water extract, not less than 4,8

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3. Methods

The study of the physical-chemical properties of the protein hydrolyzate obtained from the edge cutting of the reindeer legs was carried out by the standard methods used in assessing the quality of the fur and fur semifinished product. The evaluation of the colloidal-chemical properties was carried out by the stalagmometric method, and the wetting angle was determined by the Goniometer LK-1 instrument.

The rheological properties of the protein hydrolyzate were evaluated by the Brookfield DV3T rotary viscometer, with a CPA-40Z spindle for measuring the dynamic viscosity of a sample in the range from 0,15 to 3,065 sPs, with the spindle rotation speed of 20 rpm. The amino acid composition of the protein hydrolyzate was determined on the “Capel 105 M” (capillary electrophoresis system).

4. Results

Table 1: Assessment of the chemical properties of the

edge cutting of reindeer legs

Table 2 - Summary of the physicochemical properties of the protein hydrolyzate obtained by the acid method

Index Parameters of the protein hydrolyzate

Mass fraction of nitrogen,% 3,5 Mass fraction of protein,% 21,8 Mass fraction of unbound fatty substances,% 5,6 Mass fraction of mineral substances,% 0,02 Mass fraction of dry residue,% 5,5 Density, kg / m3 1320 pH 4,8

Figure 1 - Effect of the consumption of protein hydrolyzate upon the change in the surface tension

Figure 2 - Dynamic viscosity change of protein hydrolyzate with spindle rotation speed

Figure 3- Amino acid composition of the protein hydrolyzate obtained from the edge cutting of reindeer legs obtained by the acid method

Conclusions

1) Physical-chemical characteristics of the edge cutting of kamus skins reindeer have been studied.

2) The possibility of obtaining the protein hydrolyzate from the edge cutting of the reindeer legs using the acid method is shown. The resulting protein hydrolyzate was a homogeneous liquid of a beige color with the smell characteristic of animal raw materials.

3) The obtained bioactive material has surface-active properties

4) The material refers to non-Newtonian fluids, thixotropic subsystems that are stable in time and change their structure upon application of a mechanical load

5) The amino acid composition of the bioactive preparation includes 15 amino acids with glycine, alanine and lysine forming the majority.