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CONTENTS

PAGE

Ildikó Bujusz, József Csanádi, József Fenyvessy 5
DETERMINATION OF THE AMINO ACID AND SOLID CONTENT IN THE RAW EWE'S MILK

Sándor Beszédes, Zita Seres, Zsuzsanna László 9
OPTIMIZATION OF MICROWAVE PROCESS TO IMPROVE THE BIODEGRADABILITY OF MEAT PROCESSING SLUDGE

István Bíró, Béla M. Csizmadia, Zoltán Müller 16
INTRODUCTION OF COMPUTER AIDED METHOD IN EDUCATION OF MECHANICS AT THE FACULTY OF ENGINEERING IN UNIVERSITY OF SZEGED

József Csanádi, Zsuzsanna H. Horváth, Annamária Kiss 22
A SIMPLE METHOD FOR OBSERVING RENNET COAGULATION IN GOAT MILK

Ernő Gyimes, Balázs P. Szabó, Antal Véha 31
DEVELOPMENT ENGINEERING OF LONG-LASTING PASTRIES MADE WITH DIFFERENT TYPES OF HONEY

György Hampel 35
SOME THOUGHTS ABOUT DATA AND INFORMATION

György Hampel, Orsolya Szász, Zita Battyáni 42
E-CONTENT FOR MEDICAL STUDENTS

Ildikó Horváth Gálné, József Gál 48
IN THE SOUTH PLAIN REGION THE LACK OF HARMONY HAS A NEGATIVE IMPACT ON ECONOMIC EFFICIENCY

Gabriella Keczer 52
CORPORATE GOVERNANCE OF THE BKV – WHO IS RESPONSIBLE FOR THE SCANDALS?

Ádám Kerényi 61
THE STABILIZER FISCAL POLICY AND ITS LONG-TERM EFFECTS

Tibor Könyves, Marija Škrinjar, Mira Ač 66
FUNGAL CONTAMINATION OF MILKING COWS FEED

Sándor Nagy 71
NEW PARADIGM: EVOLUTIONAL APPROACH IN THE ECONOMIC GEOGRAPHY

József Sárosi, Tamás Szépe, János Gyeviki 75
FUNCTION APPROXIMATION FOR THE FORCE GENERATED BY DIFFERENT FLUID MUSCLES

Balázs P. Szabó, Antal Véha, Ernő Gyimes 81
CONNECTION BETWEEN THE GRINDING ENERGY DEMAND AND THE WHEAT KERNEL HARNESS

László Terjék 86
THE ORGANIZATIONAL JUDGMENT OF THE LEADERSHIP MISTAKES RELATED TO WORK SAFETY IN THE AGRICULTURAL UNDERTAKINGS

Noémi Vanderstein 93
THE ROLE OF INDUSTRY IN 'KEEPING THE POT BOILING' IN THE REGION OF SOUTHERN HUNGARY DURING THE ERA OF SOCIALISM

Edina Vincze-Lendvai 97
ANALYSIS OF A VILLAGE FROM THE POINT OF MARKETING

Zsótér Brigitta 102
ALTERATION OF THE EMPLOYMENT-SOCIAL STRUCTURE OF THE POPULATION OF MEZŐHEGYES

DETERMINATION OF THE AMINO ACID AND SOLID CONTENT IN THE RAW EWE'S MILK

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ABSTRACT

During our experiments we have performed a complete amino acid and solid content analysis from the individual milk of the three Tsigai strains and the Awassi R_1 sheep. We have taken individual milk samples on the given plants in two months of the lactation for two times. For the inspections we have used the milk of totally 14 individuals milked during one day.

1. INTRODUCTION

The sheep's milk proteins contain the essential amino acids in the sufficient quantity and proportion, so they can be considered as full protein for the human organism (Gordon and Kalan, 1978; Sawaya and Safi, 1984; Anifantakis, 1986). The sulphur-bearing and essential amino acids are present in the sheep's milk in higher proportion than in the cow's milk. This advantageous feature will be supplemented also with the better digestibility and more favourable utilisation ratio of the proteins of the sheep's milk.

During our experiments we have performed a complete amino acid and solid content analysis from the individual milk of the three Tsigai strains and the Awassi R_1 sheep. The Tsigai breed of Csóka can be found in the training farm of the Centre of the Agrarian and Technical Sciences of the University of Debrecen, the ewes of Jucu and Milking are in Balmazújváros, on the farm of the breeder, Gábor Pál and the Awassi R_1 sheep can be found at the Bakonszegi Awassi Plc.

All three Tsigai strains were of free livestock breeding, they have spent only the nights in the sheepcote. Their soiling was based on grazing, typically extensive. The supplementation of their forage was composed identically. The method of the livestock of the Awassi R_1 breed is intensive, stabled, the forage technology consists of winter and summer forage. The ewes examined by us were 3-4 years old at the beginning of the sampling and they were with lamb with the third progeny generation.

The amino acid and the solid content analysis were performed from the individual milk samples of the Tsigai and Awassi R_1 breeds. The raw milk samples were taken from the animals according to the standard MSZ EN ISO 707 : 2000 in the works, with the help of the workers of the plant. The technology of milking was not uniform. In case of the Tsigai strains the milking was carried out manually, the first milk flow was separated and the udders were completely milked. In Bakonszeg we have applied mechanical milking, the sampling was performed with a 2×24 position milking machine type DeLaval.

2. DETERMINATION OF THE AMINO ACID AND SOLID CONTENT

The amino acid content of the samples was defined with ion-exchange column chromatography, with a device INGOS AAA 400. For the determination of the amino acid composition of the proteins as the first step the amino acids constituting a polypeptide chain shall be released from their bonds with hydrolysis. Afterwards the separation of the amino acid

can follow with ion-exchange column chromatography. During the separation the acidic and hydrox amino acids separate from the ion-exchange column faster, while the basic amino acids more slowly and the neutral amino acids have a middle value between both extreme groups. The results of the amino acids content are shown in Table 1.

Table 1. Amino acid content in different type of sheep milk (g/100g milk)

Sample	Jucu Tsigai		Milking Tsigai		Csóka Tsigai		Awassi R_1	
Amino acid	Mean g.AA/100g milk	deviation	Mean g.AA/100g milk	deviation	Mean g.AA/100g milk	deviation	Mean g.AA/100g milk	deviation
Aspartic acid	0,31	0,02	0,33	0,05	0,30	0,01	0,38	0,02
Threonine	0,17	0,01	0,18	0,03	0,17	0,00	0,21	0,01
Serine	0,21	0,01	0,23	0,04	0,21	0,01	0,25	0,01
Glutaminic acid	0,87	0,07	0,94	0,15	0,87	0,02	1,02	0,05
Proline	0,47	0,02	0,52	0,08	0,49	0,02	0,57	0,02
Glycine	0,08	0,00	0,09	0,01	0,08	0,00	0,09	0,01
Alanine	0,15	0,01	0,16	0,02	0,15	0,00	0,18	0,01
Cysteine	0,04	0,00	0,03	0,01	0,04	0,00	0,05	0,01
Valine	0,26	0,02	0,27	0,04	0,26	0,01	0,29	0,01
Methionine	0,14	0,01	0,15	0,02	0,14	0,00	0,16	0,01
Isoleucine	0,20	0,01	0,21	0,03	0,19	0,01	0,23	0,01
Leucine	0,40	0,03	0,41	0,06	0,39	0,01	0,46	0,01
Tyrosine	0,17	0,01	0,18	0,03	0,17	0,00	0,21	0,02
Phenilalanine	0,19	0,01	0,20	0,03	0,19	0,01	0,23	0,01
Lisine	0,33	0,03	0,35	0,05	0,33	0,01	0,40	0,01
Histidine	0,11	0,01	0,12	0,02	0,11	0,00	0,13	0,01
Arginine	0,14	0,01	0,15	0,02	0,14	0,01	0,16	0,01
Tryptophan	–	–	–	–	–	–	–	–
Ammonia (NH_3)	0,06	0,01	0,07	0,01	0,06	0,00	0,70	0,00
Amount	4,32	0,30	4,62	0,70	4,30	0,11	5,12	0,19
N% x 6,25	4,43	0,30	4,75	0,70	4,38	0,13	5,26	0,20
Solid content %	15,90		15,95		14,52		18,66	

Our examination results confirm the opinions, according to which the amino acid set of the sheep's milk is biologically more valuable than that of the cow's milk (Gordon and Kalan, 1978; Sawaya and Safi, 1984; Anifantakis, 1986), which results of the bigger share of the essential amino acids.

Fenyvessy (1990) and Csapó (1992) have defined the amino acid set of the botany merino sheep and examined the alterations occurred within the lactation respectively. The results received for the amino acid amounts and the values of the essential and non-essential amino acid proportions measured by us harmonized with the results received by the mentioned authors concerning the botany merino sheep.

In case of the examination of the amino acid content the Tsigai strains can be considered as one group from the aspect of comparison, and the total amino acid content of their milk is almost 15% lower than that of the Awassi R_1 breed (Table 1.).

Table 2. Classification of amino acids according to Gergely (2000)

		Amino acids
From the point of view of nutrition biology	essential amino acids	valine, leucine, isoleucine, phenilalanine, triptophan, methionine, threonine, lisine
	semi essential amino acids	cisteine, tyrosine
	non essential amino acids	arginine, glicine, alanine, proline, serine, asparagine, glutamine, asparagine acid, glutamine acid, histidine

Gergely, 2000.

Upon examination of the proportion of the essential and non-essential amino acids, comparing our results with the essential amino acid demand determined by FAO/WHO and the amino acid composition of the sheep's milk protein it can be ascertained, that the essential amino acid content of the milk of the Tsigai strains and the Awassi R_1 breed significantly exceed the demand, so the amino acid demand of the developing organism can be completely satisfied (Figure 1.).

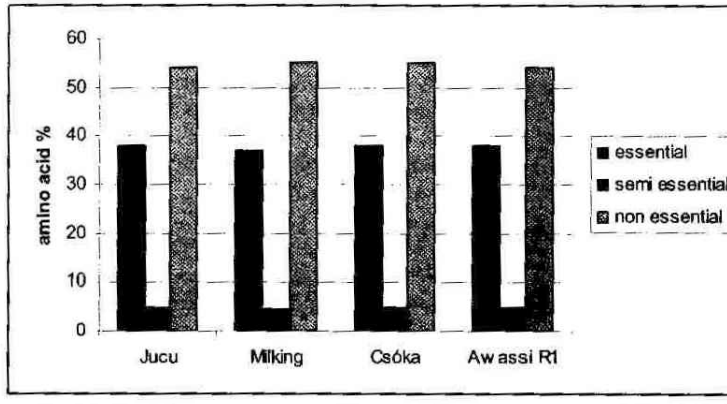

Figure 1. Classification of the amino acid content from the point of view of nutrition biology in different raw ewe's milk sample

Based on our results received during the solid matter content examination, which plays an important role from the point of view of cheese yield, it can be declared, that there is a difference also in the solid matter content between the Tsigai strains and the Awassi R_1 breed. The values of the Tsigai strains of Milking, Jucu and Csóka are similar, so they have constituted a homogeneous group. In case of the Awassi R_1 breed we have measured higher values significantly deviating from these strains (Figure 2.).

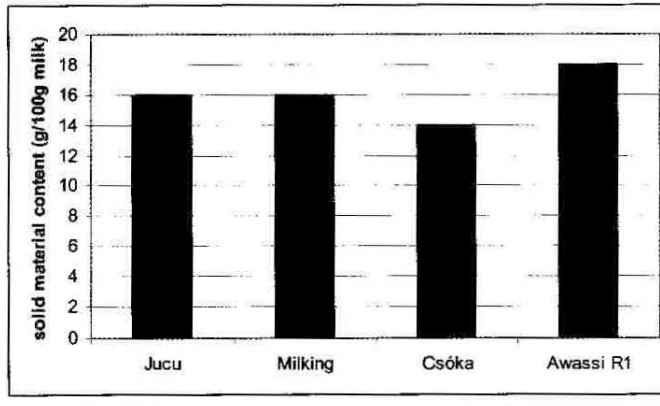

Figure 2. Solid matter content in different raw ewe's milk sample

REFERENCES

1. Anifantakis, E. M. (1986): Comparison of the physico-chemical properties of ewe's and cow's milk. In: Proceedings, IDF Seminar Production and Utilization of ewe's and goat's milk. Athens, Greece. International Dairy Federation Publ., Brussels, Belgium, Bulletin No. 202. p. 42–53.
2. Csapó J. (1992): Kérődző háziállatok kolosztrum és tejösszetétele, és néhány összetevő analitikája. Akadémiai Doktori értekezés, Kaposvár. p. 4–45.
3. FAOSTAT Database: www.fao.org, 2007.
4. Fenyvessy J. (1990): A juhtej analízise és ipari feldolgozásának lehetőségei. Kandidátusi értekezés, KÉE Élelmiszeripari Főiskolai Kar, Szeged. p. 5–112.
5. Gergely P. (2000): Szerves és bioorganikus kémia. Egyetemi tankönyv, Budapest. p. 98–103.
6. Gordon, W. G., Kalan, E.B. (1978): Protein of milk. In: Fundamentals of Dairy Chemistry. The Avi Publishing Co., Inc., Westport, Connecticut, USA. p. 87.
7. MSZ EN ISO 707 : 2000. Tej és tejtermékek. Mintavételi útmutató.
8. Sawaya W. M., Safi, W. J. (1984): Studies on the chemical composition and nutritive values of sheep milk. Milchwissenschaft 39. (2). p. 90–93.