

9. PROJEKTI KULUD RAHASTAMISPERIOODIL 2600000 krooni

	Kokku	Kulude jagunemine aastate kaupa				
		2003	2004	2005	2006	2007
Töötasud	1194218	181690	213196	197310	278953	323069
Sotsiaalmaks	394096	59958	70355	65114	92056	106613
Töötuskindlustusmaks	4765	908	1068	987	838	964
Üldkululõiv (kuni 20%)	463593	67796	67797	80000	124000	124000
Kinnistute, hoonete ja ruumide majandamise kulud (kuni 20%)						
Ostetud teenused	285513	3615	6344	4605	162539	108410
Lähetuskulud	42254	1808	0	9871	15000	15575
Muu erivarustus ja -materjal	93208	17331	12970	28531	18311	16065
Masinad, seadmed	28354		27700	654		
Muud kulud	93999	66894	570	12928	8303	5304
Kokku	2600000	400000	400000	400000	700000	700000

Kõiki kulusid põhjendada lisan

10. PROJEKTI LÕPPARUANNE:**I TOORPIIMA LAAPUMISOMADUSTE PARANDAMINE**

Eesmärgiks oli selgitada, millised on peamised piima laapumisomadusi mõjutavad faktorid ja milliseid pidamistehnoloogilisi ning aretuslikke võtteid oleks võimalik Eesti piimakarjafarmides rakendada varutava piima laapumisomaduste parandamiseks.

Projekti täitmisel jagati uurimisvaldkond järgmisteks alateemadeks: (vastavat alateemat käsitlevad ilmunud teaduspublikatsioonid, milledest olulisemad on aruandele lisatud)

- Piima laapumisomadusi mõjutavad tegurid (Kübarsepp, jt. *Agraarteadus*, 2003)
- Piimavalkude genotüüpide mõju piima laapumisomadustele (Kübarsepp, jt. *Agronomy Research*, 2005; Kübarsepp, jt. *8th WCGALP*, 2006; Jõudu, jt. *Agricultural and Food Science*, 2007)
- Eesti veisetõugude piima valgulist koostist mõjutavaid tegureid ning piima valgulise koostise mõju piima laapumisomadustele (Jõudu, jt. *International Dairy Journal*, ilmus)
- Pidamistehnoloogiliste tegurite mõju varutava piima koostisele, kvaliteedinäitajatele ja laapumisomadustele (Jelizaveta Kaplenko, magistritöö, 2007)
- Söödaratsiooni rasvaallika mõju piima laapumisomadustele ja juustu kvaliteedile. (Mihhejev, jt. *Veterinaria ir Zootechnika*, 2007)
- Organismi happe-aluse tasakaalu mõju piima laapumisomadustele
- Söötmise mõju piima laapumisomadustele

II SOMAATILISTE RAKKUDE ARVU VÄHENDAMINE

Eesmärgiks oli selgitada millised tegurid mõjutavad nii piima kvaliteedi kui ka udara tervise näitajat, somaatiliste rakkude arvu (SRA). Katseid tehti erineva pidamis - ja lüpsitehnoloogiaga piimakarjafarmides.

Projekti täitmisel jagati uurimisvaldkond järgmisteks alateemadeks: (vastavat alateemat käsitlevad ilmunud teaduspublikatsioonid, milledest olulisemad on aruandele lisatud)

- Lüpsivõtete mõju piima somaatiliste rakkude arvule (Kiiman, jt. *Proceedings of the 12th Baltic Animal Breeding Conference*, 2006)
- Nisaotsa muutusi mõjutavad faktorid

Projekti täitmise käigus moodustatud andmebaaside kirjeldus on esitatud tabelis 1 (vt lisa 1).

Uurimistulemuste lühikokkuvõtted alateemade lõikes ning soovitusel piimatootjatele on esitatud lisan 2.

Projekti täitmisel saadud uusi teadmisi on Eesti piimatootjatele tutvustatud järgmistel õppepäevadel:

- Teaduslik-praktiline konverents loomakasvatajatele 2003, 12.12.2003., EPMÜ
- OÜ Tervisliku Piima Biotehnoloogiate Arenduskeskuse õppepäev. 28.04. 2006
- Infopäev „Piima kvaliteet” 2007-2008 (viieteiskümnes maakonnas).

- Projektiga seotud magistrant Marika Oesalg kasutab saadud uusi teadmisi nii õppetöös (Olustvere TMK) kui ka nõustamistegevuses.

Projekti edasiarendusena on TERVISLIKE PIIMATOODETE BIOTEHNOLOOGIA ARENDUSKESKUSE alamprojektina rakendunud pullide hindamine piima laapumisomaduste alusel.

11. LÜHIKOKKUVÕTE:

IMPROVEMENT OF RAW MILK COAGULATION PROPERTIES

Results based on database collected from Põlula research farm during the years 2001-2005, from 6 farms suggested by the animal breeding organisation during the years 2003-2004, from 6 farms raised EN cows during the year 2004 and from 69 farms delivering their milk to one dairy plant during the years 2005-2006.

Factors affecting coagulation properties of milk. Individuality of a cow, stage of lactation, breed, pH and milk calcium content significantly affected all measured coagulation properties. Milk protein content affected RCT and E_{30} , and milk phosphorus content only E_{30} . Coagulated milk samples contained more protein than noncoagulated samples. The renneting properties showed marked lactational changes. The milk coagulation properties were at their best during the 1st month of lactation (5...30 d after calving) and again from the 5th month (>150 d after calving) onward. From all noncoagulated milk samples most fell in the period of 61...120 days after calving. The milk characterized by abnormal rennetability was more frequent among stage of lactation than the breed. Coagulation properties of milk from cows of different dairy breeds raised in Estonia were higher in EN group. Percentage of noncoagulated milk samples was the highest in RHF group. An increase in somatic cell count over 500000 ml^{-1} resulted in a decreased rennet coagulation properties of milk. (Kübarsepp, *et al. Agraarteadus*, 2003)

Influence of milk proteins genetic polymorphism on rennet coagulation properties. All measured rennet coagulation parameters were significantly better for the κ -casein BB and worse for the κ -casein AA genotype. κ -Cn BB exhibited also the lowest percentage of noncoagulated milk samples and samples that did not reach K_{20} 30 min after enzyme addition. Milk from cows producing the AB and BB genotype of κ -casein was more suitable for cheesemaking throughout the lactation. β -Lg genotypes had no significant effect on milk rennet coagulation parameters. (Kübarsepp, *et al. Agronomy Research*, 2005)

The frequencies of κ -Cn A, B, and E allele were 0.739, 0.202 and 0.059, respectively. Results of earlier studies in Estonia about allele frequencies of κ -Cn indicate that the κ -Cn B allele frequency was considerably decreased in the Estonian Holstein cows. Frequency of κ -Cn B allele among local red breed (EPK) has remained on the same level. In earlier studies has not been detected presence of κ -Cn unfavourable E allele. Better milk rennet coagulation properties among native breeds are explicable with higher frequency of κ -Cn B allele. (Kübarsepp, *et al. 8th WCGALP*, 2006)

Among EN cows we found 16 aggregate casein genotypes (α_{s1-} , β -, κ -caseins), of which four – namely, BB A^2A^2 AA (21.2%), BB A^1A^2 AB (16.9%), BB A^1A^2 AA (14.4%), and BB A^2A^2 AB (10.2%) – occurred among nearly two-thirds of the analysed cows. Aggregate casein genotype had a significant overall effect on rennet coagulation parameters. Better rennet coagulation properties were found for aggregate casein genotypes CC A^2A^2 AB and BC A^1A^2 BB, among frequent genotypes for BB A^1A^2 AB. (Jõudu, *et al. Agricultural and Food Science*, 2007)

Milk protein composition - factors influencing it and effect on milk rennet coagulation. The contents of the analysed milk proteins (α_{s1-} , α_{s2-} , β - and κ -Cn, and β -Lg) and the relative contents of different caseins in total casein were significantly influenced by sampling month, breed, and the month of lactation. Milk protein, casein, α_{s2-} -Cn, κ -Cn, and β -Lg content, and the relative contents of α_{s1-} and κ -Cn in total casein were higher in milk from cows of the Estonian Red breed than those of the Estonian Holstein breed.

An increase in milk protein, casein, analysed casein fractions, and the casein number decreased the rennet coagulation time of milk and increased curd firmness. Milk formed a firmer curd when the relative content of α_{s1-} and β -Cn in total casein was lower, or the relative content of κ -Cn in total casein was higher. Higher values of κ -Cn: β -Cn and κ -Cn: α_{s-} Cn ratios had a positive effect on curd firmness. (Jõudu, *et al. International Dairy Journal*, in press)

A comparison of the methods for determination of the coagulation properties of milk. The study compared two measuring systems applied to determine the coagulation properties of milk: the previous Formagraph and the new Optigraph methods. We found a strong correlation between the rennet coagulation properties of milk measured with the Formagraph (E_{30}) and the Optigraph (A_{30}). The best

approximation of curd firmness, determined by the Optigraph, gives a quadratic function ($E_{30} = -0.0357 * A_{30}^2 + 2.8795 * A_{30} - 5.2991$) that allows a comparison (simultaneous use in analyses) of curd firmness measured by both techniques, the Formagraph and the Optigraph. (Kübarsepp, *et al. Acta Scandinavica A*, 2005)

Effects of fat-rich oil cakes on cheese fatty acid composition, and on cheese quality(Mihhejev, *et al. Veterinaria ir Zootechnika*, 2007)

The objective of this study was to determine the effect of fat-rich oil cakes used in Estonia on milk and cheese quality. The experiment was conducted with Estonian Holstein dairy cows according to 4x4 Latin square design. The cows were fed *ad libitum* grass silage, 8 kg concentrate consisting of barley and oat meal, soybean meal and cold pressed oil cakes as fat sources (0.5 kg crude fat per animal per day) – rapeseed (RC), linseed (LC), gold of pleasure (*Camelina sativa*) cake (GP) and soybean meal (SBM) as the non-fat control variant – and a mineral-vitamin supplement. The inclusion of fat-rich cakes in the diet affected the overall fatty acid composition of cheese. Diets rich in unsaturated fats increased long-chain unsaturated fatty acids in milk and cheese fat, CLA included. Processing the milk into cheese did not alter the overall fatty acid profile. The treatment had a significant effect ($P < 0.05$) on milk coagulation time and curd firmness. There were no significant effects on the experimental cheese estimates of dry matter and fat, or on the fat content in dry matter. Fat source had a slight effect on the overall quality score and texture/colour parameter of the experimental cheese ($P < 0.05$). The quality score for treatment tended to decrease as follows: LC>SBM>RC>GP. The taste panelists found no flavour and no taste differences in cheese among treatments (except between LC and GP), although the presence of specific flavour (above perceptible level) was much higher in GP than in other treatments. The experimental results suggest that fat supplementation affects cheese fatty acid composition, milk coagulation parameters and cheese quality properties, depending on the degree of saturation the fat supplement.

LOWERING SOMATIC CELL COUNT

There were several problems with somatic cell count affecting milk quality and udder health on dairy cattle farms of Estonia (in 1999...2003 the milk somatic cell count was between 400 000... 500 000 cells/ml) and 26% of cows were culled due to udder diseases. These circumstances give the reason to investigate the impact of milking procedures on somatic cell count in milk. In the present study, the work activities of 36 milking operators were observed. The duration of each element of the working process was recorded. Nine milkers worked in milking parlours and 27 milkers with pipeline milking equipment. From data analysis observed that the adequate pre-milking cow preparation for milking was essential to milk somatic cell count ($P < 0.01$). The delay in application of the milking machine was affected milk somatic cell count ($P < 0.05$). Statistically significant was the effect of machine stripping to milk somatic cell count ($P < 0.05$). It appeared from the observations, that milkers did not pay enough attention to watching the milking machines- result was over-milking. Milk somatic cell count was remarkably lower- 214 000/ml, when over-milking was not observed and higher- 481 000/ml, when there was over-milking in one or more udder quarters ($P < 0.001$).

There were investigated the factors affecting teat end condition. The 29 pulsators were tested in milking processes. It was observed that when the teat end condition became worse the milk SCC of this udder quarter was higher ($P < 0.05$). More frequent deteriorations were noticed on the teat end of right first udder quarter ($P < 0.001$). From this we can conclude that front teats (teat end) were more affected. Prolonged milking (low vacuum, < 40 kPa) and too high vacuum level - > 45 kPa affected teat end condition. Vacuum level was essentially affected milk SCC ($P < 0.001$).

12. PROJEKTIGA HAAKUVAD TEADUSTEEMAD, GRANDID, DOKTORI- JA MAGISTRITÖÖD, JÄRELDOKTORITE UURIMISTEEMAD, LEPINGUD, PATENDID:

Sihifinantseeritav teadusteema (0422102s02): Loomakasvatuse produktsiooni ja aretuse säästlike strateegiate majanduslik ja bioloogiline modelleerimine.

Grant nr 4823: Lüpsiseadmete eri tüüpide, tehniliste parameetrite ja kasutusvõtete mõju toorpiima kvaliteedile

Põllumajandusministeeriumi lepingud:

Nr 144: Eesti veisetõugude toodanguvõime ja tervisliku seisundi väljaselgitamine kõrge söötmistaseme korral.

Doktoritööd:

Geneetilise polümorfismi mõju piimavalkude koostisele ja piima tehnoloogilistele omadustele. Söötmise mõju piima laapumisele.

Magistritöö:

Nisaotsa muutusi mõjutavad faktorid masinlüksil.

Varutava piima koostis ja laapumisomadused: aastaringne dünaamika ning pidamis-tehnoloogiliste tegurite mõju.

13. KOOSTÖÖ:

Enesetäiendus välisriikide:

- K. Mihhejev, NOVA kursus doktorantidele "Farm Animal Nutrition and Feed Technology", Norra põllumajandusülikool, Lillehammer, 10...20. 06. 2003.
- Kübarsepp, NOVA kursus doktorantidele "Quantitative Genetics in Animal Breeding" Helsingi Ülikool, 4...15. 08. 2003.
- K. Mihhejev, Technische Universität München, Weihenstephan Center of Life and Food Sciences, 06. 10. 2003...01. 02. 2004.
- Kübarsepp, I. NOVA kursus doktorantidele "Design and Optimisation of Animal Breeding Programmes", Taani Kuninglik Veterinaaria ja Põllumajanduse Ülikool, Odense, 11...22. 08. 2004.
- Kübarsepp, I. NOVA kursus doktorantidele "Milk Composition – Functional Genomics", Rootsi Põllumajandusülikool, Uppsala, 20...24. 09. 2004.
- Kübarsepp, I. Technische Universität München, toorpiima kvaliteedi laboratoorium Freisingis, 06...10. 04. 2004.
- Kübarsepp, I. NOVA kursus doktorantidele „Genes and environment”, Rootsi Põllumajandusülikool, Uppsala, 9-16. 06. 2005.
- Kübarsepp, I. Helsingi Ülikool Loomakasvatuse osakond ja MTT Agrifood Research Finland, Food Research, 7-11. 02. 2005.
- Mihhejev, K. NOVA kursus doktorantidele „Participant of the NOVA University Course "Digestion and metabolism of dairy cows from a modelling perspective". - SLU. Dept. of Animal Nutrition and Management, Uppsala, Sweden, August, 22 - September 1, 2005.
- Mihhejev, K. SLU kursus doktorantidele „Participant of the SLU Course for Ph.D students "Forage evaluation in ruminant nutrition". - SLU. Department of Agricultural Research for Northern Sweden, Umeå, Sweden, Nov 14 - Nov 18, 2005.
- Ivi Jõudu (Kübarsepp) IDF-ISO Analytical Week 2006. 29. May - 2. June, Vilnius, Lithuania.
- Ivi Jõudu (Kübarsepp) 3rd International Symposium: Milk Genomics & Human Health. 19.- 21. September, 2006, Brussels, Belgium
- Konstantin Mihhejev – "Forage evaluation in ruminant nutrition", NOVA University Course. SLU. Department of Agricultural Research for Northern Sweden, Umeå, Sweden. November, 11 – November 16, 2007.
- Konstantin Mihhejev – "Biomodelling in agriculture", BOVA University Course. LLU. Latvian university of agriculture, Jelgava, Latvia. October, 15 – October 20, 2007.

Esinemise (suulised ja posterettekanded) välisriikides korraldatud teadusfoorumitel.

- International Conference on Housing, Engineering and Environment in Livestock Farming, 25th...27th March 2003 in Vechta, Germany
- Baltic Animal Breeding Conference, Sigulda 29-30 May 2003
- "Research for Rural Development 2003", Latvia University of Agriculture, Jelgava 21-24 May
- 54th Annual Meeting of the European Association for Animal Production, Italy, September 2003
- "Nordic Agriculture in Global Perspective", 2003. NJF's 22nd Congress, July1-4, Turku, Finland
- "Research for Rural Development 2004", Latvia University of Agriculture, Jelgava 19-22 May
- 11th Baltic Animal Breeding and Genetics Conference, Palanga, Lithuania 13-14th May, 2005
- 56th Annual Meeting of the European Association for Animal Production, Sweden, 5-8th June, 2005
- Congress on Computers in Agriculture and Natural Resources. Dairy and Animal Production Systems. Vila Real, Portugal, 2005.

- 8th World Congress on Genetics Applied to Livestock Production
- 27th IDF World Dairy Congress, Shanghai, 2006
- XII Baltic Animal Breeding and Genetics Scientific Conference, 27-28th April 2006, Jurmala
- International Conference "Development of Agricultural Technologies and Technical Means in Ecological and Energetic Aspects", No.11, 14-15 September 2006, Raudondvaris.
- International scientific symposium on physiology of livestock, Kaunas, 27-28 September, 2007.
- 4th International Symposium "Milk Genomics & Human Health", 7-9. nov. 2007, Napa, California, USA

14. TEEMA RAAMES ILMUNUD PUBLIKATSIOONID:

- Jõudu, I., Henno, M.,** Kaart, T., Püssa, T., Kärt, O. The effect of milk proteins' contents on the rennet coagulation properties of milk from individual dairy cows. *International Dairy Journal* [ilmumas]
- Jõudu, I., Henno, M.,** Värvi, S., Kaart, T., Kärt, O., Kalamees, K. (2007). Milk protein genotypes and milk coagulation properties of Estonian Native cattle. *Agricultural and Food Science*, 16, 222 - 231.
- Mihhejev, K., Henno, M.;** Ots, M., Rihma, E., Elias, P., Kuusik, S., Kärt, O. (2007). Effect of fat-rich oil cakes on cheese fatty acid composition, and cheese quality. *Veterinätija ir Zootehnika*, 40, 55-61.
- Rihma, E.; Kärt, O.; **Mihhejev, K.; Henno, M.; Jõudu, I.;** Kaart, T. (2007). Effect of dietary live yeast on milk yield, composition and coagulation properties in early lactation of Estonian holstein cows. *Agraarteadus: journal of agricultural science: Akadeemilise Põllumajanduse Seltsi väljaanne*, XVIII(1), 37 - 41.
- Ots, Meelis; Kärt, Olav; **Henno, Merike; Jõudu, Ivi; Mihhejev, Konstantin;** Kuusik, Sirje; Elias, Prit (2007). Effect of dietary fat sources on milk and cheese fatty acid composition. In: *Proceedings of the 13th Baltic Animal Breeding Conference: 13th Baltic Animal Breeding Conference, Pärnu, Estonia, 24-25 mai 2007.*, 2007, 54 - 58.
- Kübarsepp, I., Henno, M.,** Kärt, O, Tupasela, T. 2005. A comparison of the methods for determination of the rennet coagulation properties of milk. – *Acta Agriculturae Scandinavica, Section A -Animal Science* Vol. 55, No 4, p. 145–148.
- Kübarsepp, I., Henno, M.,** Pärna, E., Viinalass, H., Sabre, D. 2006. Frequencies of k-Cn and b-Lg genetic variants among Estonian cattle breeds and their effect on the milk renneting properties. – *Proceedings of the 8th World Congress on Genetics Applied to Livestock Production (01 - 55)*. Belo Horizonte, Brazil: Published by organising committee of the World Congress on Genetics Applied to Livestock Production
- Pärna, E.; Vallas, M.; Kaart, T.; **Kübarsepp, I.; Kiiman, H.;** Pärna, K. 2006. Genetic Improvement of Milk Coagulation Properties. – *Proceedings of the 8th World Congress on Genetics Applied to Livestock Production (01 - 55)*. Belo Horizonte, Brazil: Published by organising committee of the World Congress on Genetics Applied to Livestock Production
- Kiiman, T.** Kaart. Milking routine has an effect on cow's udder health and milk quality. *Proceedings of the 12th Baltic Animal Breeding Conference, Jurmala, Latvia 27-28 April 2006*, p. 51-56.
- Kiiman, H.,** Pärna, E., Kaart, T. 2006. Factors Affecting Milk Somatic Cell Count. *Proceedings of the 8th World Congress on Genetics Applied to Livestock Production (01-60)*. Belo Horizonte, Brazil: Published by Organising committee of World Congress on Genetics Applied to Livestock Production.
- Kübarsepp, I., Henno, M.,** Buchberger, J., Biechl, Ch., Kalamees, K. 2005. Milk protein genotypes and milk production of Estonian Native breed. – *Proceedings of the 11th Baltic Animal Breeding and Genetics Conference, 13-14th May, Palanga, Lithuania*, p. 47-50.
- Kübarsepp, I., Henno, M.,** Viinalass, H., Sabre, D. 2005. Effect of k-casein and β -lactoglobulin genotypes on the milk rennet coagulation properties. – *Agronomy Research*, Vol. 3 (1), p. 55-64.
- Kiiman, H.,** Pärna, E., **Henno, M.,** Viinalass, H. and Saveli, O. About Somatic Cell Count in Dairy production. In: J. Boaventura and R. Morais (Eds.) *Proc. of the European Federation for Information Technology in Agriculture, Food and Environment, 3rd World Congress on Computers in Agriculture and Natural Resources*. Vila Real, Portugal, 2005, p. 1260-1267. Available on the Internet: <http://www.efita.net/ISBN 972-669-646-1>
- Kiiman, H.,** Pärna, E., **Henno, M.,** Viinalass, H. and Saveli, O. Somatic Cell Count as Item of Milk Quality and its Reducing Possibilities. *Proc of the International Symposium on Management, Engineering and Informatics, Texas, USA*.
- Kiiman, H.,** Kaart, T., Saveli, O. Somatic cell count as item of milk quality and udder health. - *Proceeding*

of the 11th Baltic Animal Breeding and Genetics Conference, Palanga 13-14 May 2005, p. 54-57.

Kübarsepp, I., Henno, M., Viinalass, H., Sabre, D., Saveli, O. 2004. Effect of κ -Cn and β -Lg genetic variants on the milk renneting properties on Põlula Research Farm. – Proceedings “Animal Breeding in the Baltics”, The 10th Baltic Animal Breeding Conference, 13-14 May, Tartu, Estonia, p. 48-53.

Kübarsepp, I., Henno, M., Viinalass, H., Sabre, D., Saveli, O. Influence of κ -casein and β -lactoglobulin genotypes on the milk coagulation properties. – Proceedings “Research for Rural Development 2004”, Latvia University of Agriculture, Jelgava, 19-22. May, 14-19.

Leola A., **Kiiman H.**, Koitla K. 2003. About Milking Parlour Efficiency. – 6th International Conference on Housing, Engineering and Environment in Livestock Farming. Composition of the Proceedings 25th...27th March 2003 in Vechta, Germany, p.428...432.

Kiiman H., Saveli O., Kaart T. 2003. About factors affecting somatic cell count in milk. – Proceedings of the 9th Baltic Animal Breeding Conference, Sigulda 29-30 May 2003, p. 51...55.

Kiiman H., Kaart T., **Henno M.** 2003. Piima somaatiliste rakkude arvu mõjutavate tegurite analüüs. – Agraarteadus, **14**, 2, lk. 69...83.

Kübarsepp I., Henno M., Mihhejev K., Kärt O., Samarütel J., Ling K., Kaart T. 2003. Piima laapumist mõjutavad tegurid. – Agraarteadus, **14**, 2, lk. 84...95.

Kübarsepp I., Henno M., Mihhejev K., Kärt O. 2003. Factors influencing milk coagulation properties. – Proceedings “Research for Rural Development 2003”, Latvia University of Agriculture, Jelgava 21-24 May p. 48-52.

Teesid

Kübarsepp, I., Henno, M., Viinalass, H., Sabre, D. 2006. Frequencies of κ -casein and β -lactoglobulin genotypes among cattle breeds raised in Estonia and their effect on the milk renneting properties. – Proceedings of 27th IDF World Dairy Congress, Conference CD

Kiiman, H., Kaart, T., Henno, M., Saveli, O. Analysis of the factors affecting somatic cell count in milk. Book of Abstracts of the 56th Annual Meeting of the European Association for Animal Production, Uppsala, Sweden, 5-8 June 2005, p. 182.

Kübarsepp, I., Henno, M., Viinalass, H., Sabre, D., Saveli, O., Kaart, T. 2005. Influence of κ -casein and β -lactoglobulin genotypes on the milk coagulation properties. – Proceedings of the 56th Annual Meeting of the European Association for Animal Production, 5-8, June, Uppsala, Sweden, p. 259.
http://www.eaap.org/uppsala/Papers/added/C4.29_Kubarsepp.pdf

Kiiman H., Saveli, O., Kaart T. The factors affecting somatic cell count in milk. – Book of Abstracts of the 54th Annual Meeting of the European Association for Animal Production, Italy, September 2003,

Kübarsepp I., Henno M., Mihhejev K., Kärt O. 2003. Milk coagulation properties of dairy cattle breeds raised in Estonia and factors influencing it. – Proceedings “Nordic Agriculture in Global Perspective”, NJF's 22nd Congress, July1-4, Turku, Finland, p. 90.

Populaarteaduslikud publikatsioonid

Henno, M., Kübarsepp, I., Mihhejev, K., Buchberger, J., Biechl, Ch., Krause, I., Sperrer, I. 2004. Zum Vorkommen der genetischen Varianten der Milchproteine beim Estnischen Landvieh. – Arche Nova, 4, 12-13.

Kiiman H. 2003. Somaatiliste rakkude arvu vähendamise võimalustest piimas. – Tõuloomakasvatus, nr. 1, lk. 11-13.

Kiiman H. Piima kvaliteedi parandamise võimalustest. – "Hüva Nõu". 2003, september, lk. 3-4.

Kübarsepp I., Henno M. 2003. Piima laapumisomadused Põlula katsefarmis. – Tõuloomakasvatus, nr 2, lk. 25-27.

15. Projekti juht (ees- ja perekonnanimi): Merike Henno	Allkiri:	Kuupäev:
Taotleja esindaja kinnitus aruande õigsuse kohta (ees- ja perekonnanimi): Toomas Tiirats	Allkiri:	Kuupäev: