

C18:1, C17:0, C16:1 and C18:1 isomer C and n-3 PUFA in the upper leg meat. The interaction of the genotype and keeping system was significant for C14:1 and C18:1 isomer in the breast meat, as well as C18:1n6c in the upper leg meat ( $P < 0.05$ ).

Key-words: Peking duck, Cherry Valley, keeping system, meat quality, TBARS, FA

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## UTJECAJ OKOLIŠNIH I GENETSKIH ČIMBENIKA NA SADRŽAJ UREJE U MLIJEKU KRAVA HOLŠTAJN PASMINE

*mr. sc. Draženko Budimir (1)*

*Disertacija (2)*

Ciljevi ovoga rada bili su utvrditi u kojoj mjeri okolišni čimbenici (redosljed i stadij laktacije, starost kod prvoga teljenja, sezona teljenja, regija i stado) imaju utjecaj na sadržaj ureje u mlijeku te povezanost sadržaja ureje u mlijeku s ostalim svojstvima mliječnosti krava. Najveća razina sadržaja ureje u mlijeku zabilježena je u prvoj laktaciji, u razdoblju između 110 i 140 dana, kada se kretala oko 23,6 mg/100 ml. Na kraju prve laktacije prosječni sadržaj ureje u mlijeku iznosio je oko 21,6 mg/100 ml. Drugu laktaciju karakterizira nešto veći sadržaj ureje, u razdoblju odmah nakon teljenja, kada su zabilježene najviše vrijednosti od svih praćenih laktacija. Starost krava kod prvoga teljenja također je imala utjecaj na sadržaj ureje u mlijeku. Krave koje su telile u dobi 24.-26. mjeseca imale su najvišu vrijednost sadržaja ureje, koji je za navedeno razdoblje iznosio 23,2 mg/100ml. Najniža vrijednost sadržaja ureje zabilježena je kod krava koje su telile u dobi 18 mjeseci i iznosila je ispod 20 mg/100 ml. I sezona teljenja utjecala je na sadržaj ureje u mlijeku. U zimskoj sezoni 2004. godine zabilježene su najmanje vrijednosti sadržaja ureje u mlijeku, dok je u jesenskoj sezoni iste godine izmjeren najviši sadržaj ureje u mlijeku (24 mg/100 ml). U narednim sezonama teljenja dolazi do opadanja sadržaja ureje u mlijeku. Razlike u sadržaju ureje u mlijeku utvrđene su između županija. Najviša vrijednost heritabiliteta (0,08) ocijenjena je modelom gdje je kao usporediva grupa korištena interakcija između stada i kontrolnoga dana. U istraživanju, udio varijabilnosti pojašnjen interakcijom stado-dan kontrole, iznosio je 67%, dok je 25% varijabilnosti sadržaja ureje ostalo neprotumačeno. Taj je model korišten i pri procjeni uzgojne vrijednosti. Također je testiran i model gdje je utjecaj stada korišten kao usporediva grupa te je njime ocijenjena najniža vrijednost heritabiliteta (0,03). U modelima gdje je interakcija između stada i godina testiranja korištena kao usporediva grupa, ocijenjene su više vrijednosti heritabiliteta (0,04 i 0,05) u odnosu na

(1) Zemljoradnička zadruga "Livač", Aleksandrovac bb, 78250 Laktaši, BiH ([budimir@inecco.net](mailto:budimir@inecco.net))

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prethodni model. Izračunate fenotipske korelacije između sadržaja ureje i osobina mliječnosti: dnevna količina mlijeka, dnevna količina i sadržaj masti i bjelančevina bile su statistički značajne ( $P < 0,0001$ ). Pozitivna i niska fenotipska korelacija (0,15) utvrđena je između sadržaja ureje i dnevne količine mlijeka, između sadržaja ureje i dnevne količine masti (0,10) te između sadržaja ureje i količine bjelančevina (0,16). Između sadržaja ureje i sadržaja mliječne masti koeficijent korelacije bio je nizak i negativan (-0,05), dok je između sadržaja ureje i sadržaja bjelančevina bio nizak i pozitivan (-0,03).

Ključne riječi: kravlje mlijeko, holštajn pasmina, ureja, genetski čimbenici

## **INFLUENCE OF ENVIRONMENTAL AND GENETICAL FACTORS ON UREA CONTENT IN HOLSTEIN BREED COWS MILK**

### ***Doctoral thesis***

The aims of this paper were to determine to which extent the environmental factors (order and stadium of lactation, age with the first calving, calving season, region and herd) have the influence on the content of urea in milk, and connection of urea content in milk with other features of milk production with cows. The largest share of urea content in milk was recorded in the first lactation, in the period between 110 and 140 days, when it was around 23.6 mg/100 ml. In the end of the first lactation the average urea content in milk was around 21.6 mg/100 ml. The second lactation is characterized by somewhat bigger urea content, in the period immediately after calving when the highest values from all tracked lactations was recorded. The age of cows with their first calving also had an impact on urea content in milk. Cows that calved in the age from 24<sup>th</sup> to 26<sup>th</sup> month had the highest value of urea content, being 23.2 mg/100 ml for the stated period. The lowest value of urea content was recorded with cows that calved in the age of 18 months and it was below 20 mg/100 ml. Season of calving also influenced the urea content in milk. In winter season 2004 the lowest values of urea content in milk were recorded while in the autumn season of the same year the highest urea content in milk was measured (24 mg/100 ml). In the following calving season increase of urea content in milk followed. The differences in urea content in milk were determined between the counties. The highest value of heritability (0.08) was estimated by the model where, as a comparison group, the interaction between the herds and control day was used. In the research the share of variability was explained by the interaction herd-control

day and it was 67%, while 25% of variability of urea content in milk remained unexplained. This model was used when estimating the breeding values. A model was also tested where the influence of herd was used as a comparison group, and by this model the lowest value of heritability was estimated (0.03). In models where interaction between the herd and years of testing was used as comparison group, higher values of heritability (0.04 and 0.05) were measured with respect to the previous model. Calculated phenotypical correlations between the urea content and milk production features: daily amount of milk, daily amount and content of fats and proteins were statistically significant ( $P < 0.0001$ ). Positive and low phenotypical correlation (0.15) was determined between the content of urea and daily amount of milk, between the urea content and daily amount of fat (0.10), and between urea content and amount of proteins (0.16). The coefficient of correlations was low and negative (-0.05) between the urea content and content of milk fat, while between the urea content and content of proteins it was low and positive (-0.03).

Key-words: cow milk, Holstein breed, urea, genetical factors