

Predviđanje trajanja servisnog razdoblja krava prema količini i sastavu mlijeka na početku laktacije

Prediction of service period duration of cows according to milk yield and composition in early lactation

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PREDVIĐANJE TRAJANJA SERVISNOG RAZDOBLJA KRAVA PREMA KOLIČINI I SASTAVU MLIJEKA NA POČETKU LAKTACIJE

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Disertacija⁽²⁾

Ciljevi su ovoga istraživanja bili determinirati značajne utjecaje na trajanje razdoblja od teljenja do koncepcije (servis razdoblje), zatim utvrditi povezanost između trajanja servis razdoblja i svojstava rezultata provedbe kontrole mliječnosti te razviti sustav predviđanja trajanja servis razdoblje temeljem rezultata kontrole mliječnosti na početku laktacije (prve dvije kontrole) u populaciji holstein i simentalke pasmine krava. Statističkom obradom metodom analize preživljavanja i metodom logističke regresije obuhvaćeno je 14.864 krave holstein pasmine, s ukupno 29.278 zapisa rezultata kontrole mliječnosti, te 18.708 krava simentalke pasmine, s ukupno 37.416 zapisa rezultata kontrole mliječnosti. Vrijednosti koeficijentata korelacija između trajanja servis razdoblja i svojstava rezultata provedbe kontrole mliječnosti kretale su se unutar raspona $\pm 0,00$ do $\pm 0,20$ što upućuje na njihovu zanemarivu povezanost. Veća vjerojatnost koncepcije po svim razredima trajanja servis razdoblja u simentalke u odnosu na holstein pasminu utvrđena je analizom kretanja krivulje preživljavanja trajanja servis razdoblja. Provedbom logističke regresije izrađena su dva statistička modela. Model 1., koji uključuje varijable rezultata provedbe kontrole mliječnosti zasebno za svaku pasminu i svaki kontrolni dan. Model 2., koji, pored varijabli iz prvoga modela, uključuje i utjecaje regije, sezone i veličine stada, sezone koncepcije i sezone teljenja. Ispitivanje snage modela za predviđanje događaja prikazano je pomoću indeksa konkordacije, koji predstavlja sukladnost slaganja registriranih i predviđenih podataka unutar svakog modela. Utvrđeno je povećanje vrijednosti indeksa konkordacije za svaki model s većim rednim brojem u odnosu na početni model, kao i povećanje vrijednosti

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indeksa konkordacije za kontrolni dan 2. u odnosu na kontrolni dan 1. kod obje promatrane pasmine.

Ključne riječi: servis razdoblje, rezultati kontrole mliječnosti, holstein i simentalke pasmine, predviđanje

PREDICTION OF SERVICE PERIOD DURATION OF COWS ACCORDING TO MILK YIELD AND COMPOSITION IN EARLY LACTATION

Doctoral thesis

The objectives of this research were to determine significant effects on the duration of the period from calving to conception (service period), the relationship between the duration of the service periods and the traits recorded during the milk recording and develop a system of predicting the duration of service period based on the milk recording results in early lactation (the first two controls) in Holstein and Simmental cows population, which would consequently increase competitiveness and financial performance of the farm. Statistical analysis using survival analysis and logistic regression method included 14,864 Holstein cows with a total of 29,278 milk recording records and 18,708 Simmental cows with a total of 37,416 milk recording records. Correlation coefficient values were within the range ± 0.00 to ± 0.20 indicating a negligible correlation between the service periods duration and the traits recorded during the milk recording. Higher conception probability at all classes of service periods duration in the Simmental compared to the Holstein breed was determined using the analysis of movement survival curves for service period duration. Based on the results of logistic regression two statistical models were created. Model 1 includes traits recorded during the milk recording separately for each breed and each test day. Model 2, besides traits from model 1, also included effects of region, season of recording, herd size classes, season of conception and calving season. The power testing of the models for prediction of incident was shown using the concordance index representing the compliance agreement of recorded and predicted data within each model. The increase of the concordance index value was determined for each model with a higher number in comparison to the initial model. Additionally, the increase of the concordance index value was determined for control day 2 compared to the control day 1 for both analysed breeds.

Key-words: service period, milk recording records, Holstein and Simmental breed, prediction