Variation in bovine milk stability according to lactational stage and genetic group

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SUPPLEMENTARY FILE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Farms | | | | | |
| A | B | C | D | E | |
| *Farm description* | | | | | | |
| Area (ha) | 8.16 | 16.00 |  | 164.00 | 22.15 | |
| Location | Southwest | Southwest | Southwest | Center-South | Southwest | |
| Production system | grazing | grazing | grazing | Confinement | grazing | |
| *Feeding practices* | | | | | | |
| TMR | 0 | 0 | 0 | 1 | 1 | |
| Pasture+suppl | 1 | 1 | 1 | 0 | 1 | |
| Nutritional adequacy 1 | Insufficient | Sufficient | Sufficient | Sufficient | Sufficient | |
| *Milking practices2* | | | | | | |
| Parlor | Herring bone | Herring bone | Herring bone | Herring bone | | Herring bone |
| First strips milk | 0 | 1 | 1 | 1 | | 0 |
| CMT | 0 | 0 | 1 | 1 | | 1 |
| Pre-dipping | 1 | 1 | 1 | 1 | | 1 |
| Pos-dipping | 1 | 1 | 1 | 1 | | 1 |
| Adequate equipment cleaning | 0 | 1 | 1 | 1 | | 1 |
| Cooling tank | 1 | 1 | 1 | 1 | | 1 |
| *Sanitary management3* | | | | | | |
| vermifugation | 0 | 0 | 1 | 1 | | 1 |
| Vaccines | 0 | 0 | 1 | 1 | | 1 |
| *Heat stress mitigation4* | 0 | 1 | 1 | 1 | | 1 |
| *Herd characteristics* | | | | | | |
| N° Jersey cows | 16 | 14 | 25 | 0 | | 9 |
| N° Holstein cows | 19 | 18 | 0 | 76 | | 20 |
| N° crossbred cows | 9 | 4 | 0 | 0 | | 6 |
| Overall parity |  |  |  |  | |  |
| Jersey | 4.27+0.302 | 1.47+0.13 | 2.83+0.16 | - | | 1.86+0.46 |
| Holstein | 2.54+0.214 | 2.27+0.18 | - | 2.97+0.17 | | 2.94+0.26 |
| H x J cows | 3.26+0.41 | 2.24+0.24 | - | - | | 1.8+0.37 |
| Body weight |  |  |  |  | |  |
| Jersey | 391.13+97.11 | 387.80+4.41 | 408.91+38.50 | - | | 479.83+56.03 |
| Holstein | 547.11+81.0 | 523.63+26.52 | - | - | | 598.8+68.27 |
| H x J cows | 465.34+82.35 | 530.00+0.0 | - | - | | 496.00+70.45 |
| BCS |  |  |  |  | |  |
| Jersey | 2.5 | 3.25 | 2.5 | - | | 3.25 |
| Holstein | 2.5 | 3.00 | - | - | | 3.5 |
| H x J cows | 3 | 3.25 | - | - | | 3.38 |

Supplementary Table S1 – Description of farms, animals, feeding and general management

1 Nutritional adequacy = adequate farms were considered to be those with specialized technical assistance, balanced diets, e.g. TMR, stocked feed, no feed deficit. Nutritional inadequacy = farms without balanced diets, without specialized technical assistance, semi-confinement diets without adequate pasture management, with a shortage of pasture in times of scarcity.

2 Milking practices: adequate = adoption of most of the practices of cleaning of the udder, adequate vacuum level, pre and post dipping, cleaning of the equipment and parlor. Inadequate = absence of 2 or more items

3 Sanitary management: adequate = adoption of most of the practices such as vaccination, vermifugation, else it was considered inadequate.

4 Heat stress mitigation measures: adequate = use of shading and/or fan + sprinklers inadequate = no use or scarce during the year

Code: 0 = no; 1 = yes

*Supplementary table S2 – Meteorological conditions*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | Season | | | | | | | |
| winter | | spring | | summer | | autumn | |
| Region 1 | Region 2 | Region 1 | Region 2 | Region 1 | Region 2 | Region 1 | Region 2 |
| Mean Temperature (°C) | 20.085 | 16.2 | 28.93 | 19.72 | 25.49 | 20.48 | 19.55 | 15.37 |
| Humidity (%) | 69.57 | 77.59 | 58.29 | 76.44 | 79.92 | 78.28 | 74.95 | 77.67 |
| Mean Precipitation (mm) | 0.253 | 0.14 | 0.39 | 0.15 | 0.22 | 0.11 | 0.22 | 0.13 |
| THI | 66.54 | 62.00 | 77.50 | 66.20 | 75.65 | 67.44 | 61.78 | 60.44 |

Supplementary Table S3. P-values considering the effects of classes of days in milk (DIM\_class), breed and their interaction.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | P-values | | | | |
| Characteristics | N° | DIM\_class | | Genetic group | Interaction DIM x genetic group | Distribution  of variable | Covariate  parity |
| Body weight (kg) | 252 | 0.2832 | | 0.0001 | 0.3656 | gaussian |  |
| *Functional characteristics* | | | | | |  |  |
| Ethanol stability (°GL) | 427 | 0.0033 | | 0.0080 | 0.0195 | gamma | <0.0001 |
| Acidity (g lactic acid/100mL) | 454 | 0.7220 | | 0.0196 | 0.0310 | gamma | <0.0001 |
| pH | 459 | 0.6415 | | 0.3089 | 0.0593 | gamma | 0.9900 |
| Ionic calcium (mg/L) | 285 | 0.5327 | | 0.7577 | 0.0437 | gamma | 0.5848 |
| *Milk components* | | | | | |  |  |
| Fat (g/100g) | 489 | 0.0155 | | 0.0034 | 0.0421 | gamma | 0.0256 |
| Protein (g/100g) | 489 | 0.0001 | | 0.0001 | 0.3538 | gaussian | 0.6520 |
| Lactose (g/100g) | 489 | 0.0001 | | 0.7375 | 0.4112 | gamma | <0.0001 |
| Total solids (g/100g) | 489 | 0.0172 | | 0.0011 | 0.0185 | gamma | <0.0001 |
| Casein (g/100g) | 241 | 0.0042 | | 0.0272 | 0.1934 | gamma | 0.8418 |
| MUN (mg/dL) | 377 | 0.6378 | | 0.0238 | 0.0383 | Gaussian | 0.0505 |
| Somatic cell count (x1000) cell/ml | 489 | <0.0001 | | <0.000 | <0.0001 | poisson | <0.0001 |