1147M Effect of feeding management during the first 21 days postpartum, on direct and residual productive response and adaptation to grazing of multiparous Holstein dairy cows. C. Rivoir*[1], G. Mendina[2], L. Adrien[2], and P. Chilibroste[1], [1]*Universidad de la Republica, Facultad de Agronomía, EEMAC, Paysandú, Uruguay,* [2]*Universidad de la Republica, EEMAC Facultad de Veterinaria, Paysandú, Uruguay.*

Intensification of dairy production systems in Uruguay has involved the implementation of strategies that includes confinement with total mixed rations (TMR) either in dry lots or in low-cost barns. Questions have emerged about the productive impact of its use in short periods during early lactation (e.g., first 21 d postpartum) in multiparous dairy cows. An experiment was carried out at the Research Station "Dr. Mario A. Cassinoni" of the School of Agronomy (Paysandú, Uruguay) to study the productive response of multiparous dairy cows after a period of contrasting feeding management during the first 21 d in milk (DIM). Two treatments were compared: T21 (n = 10) were fed a TMR diet ad libitum (29.9 ± 3.5 kg DM cow^{-1} day^{-1}) and T0 (n = 13) cows started grazing the day after calving and were fed a TMR (13.3 ± 0.5 kg DM cow^{-1} day^{-1} plus 1 grazing session). At d 22 the T21 cows were moved to T0 treatment until 60 DIM. Data were analyzed as a complete randomized block design using the GLIMMIX procedure of SAS OnDemand software with a mixed model that included treatment, week and the interaction as fixed effect and block as random effects. Milk production on T21 was higher than T0 (40.1 vs. 35.1 kg cow^{-1} day^{-1}; $P = 0.007$) during the differential feeding period (0–21 DIM). During the residual period (22–60 DIM) T21 cows tended to produced more milk than T0 (39.8 vs. 38.3 kg cow^{-1} day^{-1}; $P = 0.07$). No differences were found in grazing behavior between treatments (T0: 237, and T21: 239 min^{-1} grazing day^{-1}, $P = 0.86$). It seems that these differences in milk production might be related to a carryover effect of higher dry matter intake during the transition period as well as changes in selectivity (Chilibroste et al., 2015; Menegazzi et al., 2021). Changes in feeding management during the first 21 DIM had an impact on milk production of multiparous dairy cows. Further research is required to better understand the mechanisms involved in the direct and residual responses.

Key Words: fresh dairy cow, feeding strategy, multiparous cows

1148M Characterization of heat stress in lactating Holstein cows at different lactation stage using productive performance, physiological indicators, blood, and milk characteristics based on South Korean climate conditions. J. H. Jo*[1], J. G. Nejad[1], J. S. Lee[1], M. K. Choi[1], Y. R. Kim[1], M. S. Ju[1], S. H. Keum[1], T. Z. Liu[1], S. Y. Maeng[1], H. R. Kim[2], and H. G. Lee[1], [1]*Department of Animal Science and Technology, Sanghuh College of Life Sciences, Konkuk University, Seoul, Republic of Korea,* [2]*Animal Nutrition and Physiology Team, National Institute of Animal Science, RDA, Wanju, Republic of Korea.*

Heat stress effects on lactating Holstein cows in South Korean climate conditions were investigated by analyzing productivity, physiological, blood, and milk characteristics in 2 studies. A 2-way ANOVA was performed to analyze the data using the mixed procedure of SAS. The first study tested the effect of 3 consecutive days of different temperature-humidity index (THI) ranges of moderate (85–87 and 82–84), mild (78–80 and 75–77), and comfort (72–74 and 69–71) on 80 mid-lactating cows (parity: 2.08 ± 0.13; DIM: 147.01 ± 3.34). The results indicated that mid-lactating Holstein cows exposed to an environment where the THI decreased from 85–87 to 69–71 had increased milk protein, fat, solids-not-fat (SNF), and milk urea nitrogen (MUN) levels, as well as increased hemoglobin, hematocrit, mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration, and glucose concentrations ($P < 0.05$). Conversely, milk yield, β-hydroxybutyrate, nonesterified fatty acid, blood urea nitrogen, total protein, calcium, cortisol, and rectal temperature levels were decreased in the same THI range ($P < 0.05$). The second study compared various THI levels (comfort, mild, and moderate) across 3 lactation stages (early, mid, and late) in 160 lactating Holstein cows (parity: 1.77 ± 0.06; DIM: 231.10 ± 9.84). The results indicated that THI and lactation stage had significant impacts on milk characteristics such as milk fat, protein, SNF, and MUN, while lactation stage influenced milk yield ($P < 0.05$). Lymphocyte, hemoglobin, hematocrit, and MCH were influenced by both THI and lactation stage ($P < 0.05$). In conclusion, these findings suggest that lactation stage is not the only factor influencing milk parameters, and THI has a significant impact on most parameters regardless of the stage of lactation. Additionally, implementing appropriate summer breeding management practices is important to minimize the negative effects of heat stress and to optimize milk production and quality.

Key Words: heat stress characterization, lactation stage, milk characteristics

1149M Back to basics: Precision while mixing total mixed rations and its impact on milking performance. A. Bach*[1,2], [1]*Marlex Research and Education, Barcelona, Catalonia, Spain,* [2]*ICREA, Barcelona, Catalonia, Spain.*

Details from every mixing load of TMR fed to ~8,000 cows distributed in 72 pens from 19 farms, along with individual milk yield of each cow in every pen and farm was collected from a feeding and management system (algoMilk; www.algoMilk.com) between 2020 and 2022 on a daily basis to assess the impact of quality of mixing TMR on animal performance. Divergence between expected and actual amounts of ingredients mixed in every load was calculated and expressed as a percentage relative to expected amounts. Ingredients were classified as: (1) energy grains (i.e., corn, wheat), (2) protein sources (i.e., soybean meal, canola meal), (3) hays (i.e., alfalfa hay), (4) grain silages (i.e., corn silage), (5) non-grain silages (i.e., alfalfa silage), (6) minerals (i.e., salt), and (7) straw (i.e., wheat straw). Milk yield was averaged within farm and pen on a weekly basis, and mixing divergences were also averaged by load or by ingredient type and week within pen and farm. The weekly standard deviation (SD) of mixing divergences was calculated for every pen and farm. A 2-degree polynomial mixed-effects model accounting for the random effects of farm and pen within farm, and the continuous effect of the weekly mixing divergences their weekly standard deviations (SD) was run. The average ± SD divergence of the total amount of TMR prepared was 1.55 ± 2.27%, which means that, in general, mixing errors were caused by adding an excess of one or more ingredients. Energy grains (1.0 ± 3.79%), grain-silages (2.1 ± 2.25%), hays (2.06 ± 4.08%), and protein sources (0.14 ± 3.5%) were mixed in excessive amounts; whereas non-grain silages (−1.44 ± 3.65%) and straw (−0.41 ± 7.77%) were mixed in lower amounts than expected. Divergence in the total amount of TMR and its weekly SD was negatively and quadratically ($r = −0.16$; $P < 0.001$) or negatively correlated ($r = −0.11$; $P < 0.0001$) with milk yield, respectively. The SD of the divergence in the amount of grain or protein sources was quadratically and negatively ($r = −0.10$; $P < 0.001$) or negatively correlated ($r = −0.14$; $P < 0.001$) with milk