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**Effect of replacing TMR with mid-vegetative or early bud lucerne in rumen fermentation using the rumen simulation technique (RUSITEC)**

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Milk production in Uruguay has been traditionally based on direct grazing of grasses and legumes, associated with supplementation of concentrates and/or preserved forages. An alternative is to combine TMR and pastures, also called partial mixed ration (PMR). This system may reach and even enhance both intake and milk production achieved by cows that only eat TMR, depending on the pasture inclusion level. The use of lucerne, a widely recognised forage for its beneficial effects on the ruminal environment, could be the best option to include in PMR in order to maintain nutrient digestibilities and VFA production of TMR diets. Moreover, these effects could be more pronounced with the use of lucerne in earlier stages of development. This study aimed to investigate the effects of replacing 40% of a TMR with mid-vegetative or early bud lucerne on the ruminal environment and nutrient apparent disappearance using the rumen simulation technique (RUSITEC). Treatments consisted of 3 diets formulated for high-production dairy cows: (1) 60:40 TMR: Mid-vegetative lucerne (PMR1); (2) 60:40 TMR: Early bud lucerne (PMR2); (3) 100:0 TMR (control). The diets were incubated in duplicate, performing 3 runs. Each run lasted 12 days (7 days to equilibrate the system and 5 days of sampling). Nutrients disappearance excluding DM disappearance was analyzed using a mixed model with treatment as fixed effects and run as a random effect while parameters of the ruminal environment and DM disappearance were analyzed as repeated measurements using a mixed model with treatment and sample day as fixed effects and run as a random effect. Means were compared using preplanned orthogonal contrasts (PMRs vs TMR and PMR1 vs PMR2). DM, MO, and NDF disappearance were higher in TMR ($P < 0.05$), with no significant differences between PMRs. Total VFA production was higher ($P < 0.05$) and pH was lower ($P < 0.05$) in TMR. The pH was lower in PMR1 compared to PMR2, although PMR2 VFA production was higher ($P < 0.05$). The propionic acid proportion was higher in TMR ($P < 0.05$) and no significant differences between PMR1 and PMR2 were found, while butyric acid proportion was higher in PMR1 than in PMR2 ($P < 0.05$). The acetic acid and propionic acid/acetic acid ratio was lower in TMR ($P < 0.05$) and were no significant differences between PMRs. Finally, there were no significant differences between treatments, either in gas and NH3–N daily production, CP, or ADF disappearance. In conclusion, a replacement in 40% of TMR with lucerne in early phenological stages fails to maintain fermentation products and nutrient disappearance reached with TMR. Additionally, the substitution of TMR with mid-vegetative lucerne has a lower effect in modifying pH and butyric acid proportion, while early bud lucerne modified to a lesser extent VFA production.

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**Does the new INRAtion®V5 feeding system estimate with accuracy digestibility and n outputs in lactating goats fed various diets?**

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Optimal nourishing of herbivores requires accurate rationing systems to fit at the best allowances and requirements of animals. Recently, the INRA feeding system for rationing ruminants has been updated with the development of its support software: INRAtion®V5. Some outputs of this rationing system were compared with observed data obtained at MoSAR's unit in dairy goats. Dairy goats were housed in digestibility crates. Individual weekly mean values of all results were pooled to obtain groups receiving the same basal roughage at similar stages of lactation. Several types of forages have been used: alfalfa hay, grassland hay, corn silage fed alone or associated with sugarbeet pulp silage or dehydrated alfalfa. Concentrates were either rich in fiber or non fiber carbohydrates. All diets were balanced to require energy and protein requirements. Goats were fed either separate feed ingredients (SF) or total mixed ration (TMR). Mean values were weighed by the number of observations within a group in the statistical analyses. Observations with a level of refusal below 7% were discarded. The data set included 281 observations distributed in 48 groups. Standard milk yield ranged from 0.67 to 6.80 kg/d (3.20 ± 1.227) and feeding level (FL) was comprised between 2.21 and 6.52 (3.87 ± 0.745.) The mean value of the organic matter digestibility (OMD) was 70.5 (±5.281, n = 281). The difference of the OMD observed and calculated (DiffOMD) was smaller than 0, with a significant difference between goats fed SF (−5.33) compared to those receiving TMR (−2.13). DiffOMD was correlated with FL. The regression coefficient between DiffOMD and FL was 1.36 which is half of the value proposed in the INRA 2018 system (2.74) from data mainly obtained in cattle and sheep. This means that dairy goats should be less susceptible to digestive interactions linked to FL as it was shown for the percentage of concentrate that has no detrimental effect of on OMD in goats. The cellwall (NDF) digestibility is globally well predicted by the model