



## ASPA 25th Congress Book of Abstract

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## ASPA 25<sup>th</sup> Congress

*Monopoli (BARI - ITALY), June 13-16, 2023*

### **Guest Editors**

**D'Alessandro Angela Gabriella, De Palo Pasquale, Maggiolino Aristide,  
Mele Marcello**

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# **ASPA 25<sup>th</sup> Congress**

## ***Monopoli (BARI - ITALY), June 13-16, 2023***

**#ASPA2023**

### **ASPA 25<sup>th</sup> Congress Book of Abstract**

**The 25th congress of the Animal Science and Production Association**

**“Animal Production Science: Innovations and sustainability for future generation” is under patronage of Loghi patrocini**

**Monopoli (BARI - ITALY),  
June 13-16, 2023**

#### **Venue**

**Torre Cintola Natural Sea Emotions**

**Località Capitolo - Monopoli (BARI - ITALY)**

Data were analysed using SAS statistical software. The climatic parameters were significantly affected by the sensors position ( $p < 0.001$ ), but also by the farm's area (62 vs 67 for THI average). Interaction between sensors position and farms was statistically significant, highlighting how farm management affects the THI detected above all in low and medium positions (60 vs 71 and 62 vs 69 respectively as THI average). Model for the evaluation of the behavioural parameters included farm as fixed effect and THI as a covariate, as well as the interaction between the two effects. The effect of THI was tested both as diurnal and nocturnal THI and as the number of continuous hours above two thresholds: 72 and 78. The results showed that the covariates tested always had a significant influence on the behaviors analysed. It should be noted that as the THI increased, the animals' behaviour in the two farms changed reporting different estimates but similar trends. This was probably linked to the response capacities of the animals to climatic stress in the two farms due to the different habits of the climatic-environmental conditions found on average in the two farms. As regard the milk production, the effect of the THI was evident with a general decrease for each point of increased THI, which was greater when analysing the consecutive hours above the threshold 78. The study emphasized the importance of efficient tools for both environmental and individual animal control, which contribute to animal health and welfare and avoid production losses.

#### *Acknowledgements*

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## **O532**

### **Effects of particle size distribution of TMR on peNDF, starch intake and milk production in Calabria dairy herds**

Anna Antonella Spina<sup>a</sup>, Carmen Lobello<sup>a</sup>, Anselmo Poerio<sup>a</sup>, Domenico Britti<sup>a</sup>, Mario Di Pasquale<sup>b</sup> and Valeria Maria Morittu<sup>a</sup>

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Finding an optimal balance between the amount of physically effective fibre (peNDF) and rumen fermentable carbohydrates in the diets of high-producing dairy cows is necessary to prevent sub-acute ruminal acidosis (SARA), optimize digestion, nutrient utilization, and improve dairy production. The physical effectiveness of a diet depends on several factors, of which fiber content, forage particle size and starch fermentability are the most important. In a recent study on 13 dairy farms located in Calabria, we

evaluated the particle size distribution of the TMR by Penn State Particle Separator (PSPS), reporting an excess of the long fraction (46% of the farm), of the very short fraction (15%), or of both these fractions (38%). Furthermore, a selective consumption of the very short fraction was observed in the 85% of the farms. In this work we show the effect of particle size distribution on the peNDF content of the diet. Additionally, the starch content of the diet and the quality of the milk were evaluated. In the 13 herds, only information related to the high production group of cows was considered in the study. Samples of TMR were collected in three points along the face of the feed both at the feed delivery (t0) and after feeding, just before the new fresh feed delivery (tf). Weights of feed offered and of refusals were also determined. All samples were analysed for particle size using the PSPS and its DM, NDF and starch content were determined. Furthermore, the nutritional composition of the milk was analysed by FT-IR. The peNDF content was estimated for each sample as the sum of the % of the three sieves (19 mm, 8 mm, 4 mm) multiplied by the NDF content of the sample. All diets analysed met the NDF values recommended by Penn State University (>28%) except farm 1 (26,8%). In farm 1, 2 and 11 (2 TMR-S and 1 TMR-H) peNDF >8 values were less than 15% and starch values were greater than 33%. Several authors indicate that peNDF >8 values less than 15% in diets rich in highly fermentable carbohydrates would increase the risk of SARA. In addition, the refusal of the long fraction and a selective consumption of the fine particles found in these 3 TMRs can be considered as a further element of concern. Regarding milk production, no abnormal parameters were found, probably because it was bulk milk and not individual milk. It therefore seems desirable, even in TMRs with good amounts of NDF, to verify the granulometry of the TMR.

## **O241**

### **How much is the environmental benefit of using precision livestock farming in Italian dairy farms?**

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Despite the significant improvement in efficiency of livestock sector since the 1950s and the consequent reduction of greenhouse gas (GHG) emissions per unit of product, further efforts are needed to improve the sustainability of animal productions. The aim of the study was to quantify the environmental impact of milk production and evaluate the role of Precision Livestock Farming (PLF) among the mitigation strategies of GHG emissions. Using Life Cycle Assessment (LCA) in five dairy cattle

farms in Lombardy, the Global Warming Potential (GWP) of milk production was evaluated. The assessment was repeated creating scenarios with or without the use of PLF solutions for monitoring production, fertility and udder health. Environmental benefit of introducing the Automatic Milking System (AMS) was evaluated in two farms: 8 scenarios were created assuming increases in Milk Yield (MY), by 5% and 15%, changes in milk fat and protein content and Somatic Cell Count (SCC), increases in Purchased Feed (PF) and in energy consumption. Secondly, the reduction in GHG emissions due to the adoption of automatic heat detection systems was estimated into two farms that currently use automatic oestrus detectors by simulating a scenario without the use of sensors; days in milk, MY, dry matter intake, PF, number of lactating, dead and sold cows, age at first calving were modified. To evaluate the environmental advantage of the udder health PLF monitoring systems, a mastitis detection capacity 5% lower than the actual estimated detection capacity was considered in two farms that currently possess precision systems for monitoring udder health. An increase of average SCC was assumed as well as changes in MY, discarded milk, PF and number of heifers. The AMS adoption resulted in a reduction of kg CO<sub>2</sub> eq./kg of Fat and Protein Correct Milk (FPCM) from 1.13% to 5.80% compared to conventional milking, with MY increase as main driver. Using PLF systems to detect heats decreased the GWP of 1 kg of FPCM by almost 10% compared to visual heat detection. Regarding the udder health scenario, every 5% more cows with mastitis detected led to a reduction of GWP by an average of 0.5%. All LCA scenario analyses involving the use of PLF systems resulted in reduced GWP. The application of PLF seems to reduce the environmental impact of milk production at farm level, especially when technology enhances the herd efficiency.

#### Acknowledgements

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## O484

### Influence of kisspeptin on buffalo superovulation

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The low number of embryos recovered per donor is undoubtedly the major constraint of multiple ovulation and embryo transfer (MOET) in buffaloes. Recent studies suggested to modify the MOET treatment in order to avoid steroid profile alterations and

to improve the expansion of cumulus cells during maturation, as well as the oviduct vascularization and motility. Aim of the present study was to evaluate the use of kisspeptin, a hypothalamic neuropeptide, that has been shown to stimulate the GnRH release by activating the LH pulse necessary for oocyte maturation and ovulation. Italian Mediterranean Buffalo cows were superovulated with a conventional FSH protocol ( $n = 10$ ; CTRL group) or with the same FSH protocol and the use of kisspeptin ( $n = 10$ ; KISS group). Kisspeptin was administered 3 times IM on days 11–13 and in slow release with the aid of ialuronic acid on day 13 of the MOET cycle and animals were sacrificed 18 h after last GnRH. Antral follicular count, recovery rate and oocyte quality were recorded, and plasma and follicular fluid were collected for steroid profile determination. Granulosa cells (GCs) were collected to analyse the mRNA expression of gonadotropin receptors (LHR and FSHR) and genes involved in steroid synthesis, as the cytochrome P450 family 19 (CYP19A1) and the steroidogenic acute regulatory protein (STAR). Oviducts were also collected to evaluate the mRNA expression of estrogen receptor 1 (ER1), progesterone receptor (PGR), vascular endothelial growth factor (VEGF) and VEGF receptor (FLK1). Interestingly, steroids plasma concentration increased in KISS group ( $40 \pm 2.0$  vs  $15.4 \pm 0.9$  pg/mL of E2 and  $1.1 \pm 0.2$  vs  $0.4 \pm 0.04$  ng/mL of P4, respectively in KISS and CTRL groups;  $p < 0.01$ ) while no differences were recorded in intrafollicular steroid concentrations. Even if the recovery rate was lower in KISS group (44% vs 56.6% of CTRL group;  $p < 0.05$ ), the percentage of oocytes exhibiting proper cumulus expansion was higher (72.7% vs 28.1%, respectively in KISS and CTRL groups;  $p < 0.01$ ) compared to CTRL group. In addition, the expression of CYP19A1 decreased while the expression of STAR in GCs increased in KISS group compared to CTRL ( $p < 0.05$ ). Finally, an increased expression of PGR, ER1, VEGF in the fimbria was observed ( $p < 0.05$ ) in KISS group compared to CTRL. The results suggest that the exogenous kisspeptin treatment enhance steroidogenesis, improving both oviductal and ovarian activity, and may help the ovum capture in superovulated buffaloes.

## O195

### Impact of heat stress on growth of Italian Limousine

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