HH-P01

Swedish dairy cattle veterinarians spend little time on advisory visits despite highly satisfied clients: Can training in Motivational Interviewing help to stimulate efforts?

Catarina Svensson[1], Hans Wickström[2], Lars Forsberg[3], Kristen K Reyher[4], Staffan Betnér[1], Claudia Von Brömssen[1], Alison M Bard[4], Ulf Emanuelson[1].

[1]*Swedish University of Agricultural Sciences, Uppsala, Sweden;* [2]*MeetMe Psykologkonsult AB, Gothenburg, Sweden;* [3]*MICLab AB, Stockholm, Sweden;* [4]*Bristol Veterinary School, University of Bristol, Bristol, United Kingdom.*

Preventive medicine is an important means to improve animal health and welfare as well as animal production and farm profitability. It is also important as a way to reduce antimicrobial drug use and reduce risks of antimicrobial resistance. Although dairy veterinarians have long been encouraged to increase their engagement in veterinary herd health management (VHHM) advancements are slow and veterinarians struggle to move into the role of proactive health advisors.

Objectives: The present study aimed to 1) estimate the time Swedish cattle veterinarians involved in VHHM spend on VHHM visits, 2) estimate client satisfaction with veterinarians in VHHM, and 3) investigate whether training in the client-centered communication methodology Motivational Interviewing (MI) may encourage veterinarians to increase their efforts in VHHM.

Materials and methods: The 36 veterinarians involved in VHHM, who volunteered to participate in the study, were randomized into two groups. MI veterinarians participated in a 6-month training program in MI before they conducted VHHM visits in cattle herds, whereas control veterinarians performed visits without such training. Approximately two weeks after the visits, we telephoned the clients of both groups of veterinarians and asked them to grade their satisfaction with the veterinarians' behaviour, competence and time efficiency on a 6-point Likert scale. Veterinarians recorded (weekly during a 6-month period) the number, type and length of their VHHM visits to cattle farms and the percentage of a 40 hour-week that they worked with cattle. A gamma model was used to analyze the effect of MI training on time allocated to VHHM visits. Trained veterinarians were divided into subgroups based on MI skills: poor, near moderate and moderate. Extra explanatory variables were the type of veterinarian (animal health veterinarian/general practitioner) and veterinarians' experience in VHHM ($<1, \geq1-\leq5, >5-\leq15, >15$ years).

Results: Veterinarians performed 1115 advisory visits to which they allocated a median 56 (interquartile range: 17-107; range: 6-202) hours per 6-months of full-time veterinary work with cattle. The most common visit types were service visits (521 h), strategic VHHM visits (406 h) and biosecurity visits (202 h); length of visits was a median of 1 hour (interquartile range: 0.5-2; range: 5 minutes – 8 hours). Clients were highly satisfied with their veterinarians, with median Likert scores for behaviour, competency and time efficiency of 6, 5 and 5 respectively, where 1=highly unsatisfied and 6= highly satisfied (interquartile range: 5-6). The median (interquartile range) amounts of time veterinarians who were untrained in

MI, trained in MI but with poor skills, trained in MI with near moderate skills and trained in MI with moderate skills allocated to VHHM were 22 (8-78), 70 (59-107), 38 (16-53) and 106 (73-136) hours, respectively. There was no evidence of a difference between the groups (P=0.31).

Conclusions: Veterinarians allocated little time to VHHM. The high satisfaction level indicates a large potential for veterinarians to be trusted allies in herd health management work on farms. Further studies – utilizing quantitative and/or qualitative methodologies – are needed to evaluate the potential of training in MI to stimulate efforts in VHHM.

Keywords: preventive medicine, veterinary herd health management, Motivational Interviewing, veterinarian-client communication, farmer satisfaction.

HH-P02

Reticulorumen ph, temperature and cow activity as indicators of diseases after calving

Ramūnas Antanaitis, Mindaugas Televičius, Dovilė Malašauskienė, Vida Juozaitienė, Arūnas Rutkauskas, Karina Džermeikaitė, Dovilė Bačėninaitė.

Lithuanian University of Health Sciences, Kaunas, Lithuania.

Objectives: The objective of current study was to determinate can reticulorumen ph, temperature and cow activity, registered before calving, be as indicators of diseases after calving.

Materials and methods: Lithuanian Black and White dry dairy cows (n=30) were selected according to those fitting a profile of having had a 2nd or more lactations (on average 2.9 ± 0.13 lactation). The clinical examination (identification of diseases after calving) performed from 60 days before calving, till 60 days after calving. Clinical mastitis (CM) cases were characterized by the demonstrated clinical signs, including abnormal appearance of milk (watery, flakes, fibrin clots, and so on; mild); Milk fever (MF) were characterized by sternal recumbency with typical S-shaped curve on the neck, weakness and inappetance. On clinical examination, the general health-condition was found to be poor. The body temperature was subnormal and pulse was undetectable. The cows that did not expel their placenta within 12 h were diagnosed with placental retention (PR). Cows without any clinical sign of disease after calving were characterized as clinical healthy (H). The pH temperature of the contents of cow reticulorumens and cow activity were measured using specific smaX-tec boluses manufactured for animal care.

Results: The healthy cows before calving showed the highest pH and temperature of reticulum. The highest level of activity was in PR-cows, the lowest in the CM group before calving. Reticulum pH and temperature were positively related in all groups of cows. Base of our funding pH of the reticulum statistically reliably correlated with the activity of the cows — positively in the PR group and negatively in the CM, MF and H groups. The temperature of the reticulum was negatively related to the activity of the cows. In all groups of sick cows,

we found a sharp decrease in the activity of animals 3-4 days before calving, while the activity of healthy cows increased. The temperature of reticulum sharply decreased in all groups of cows 6-7 days before calving in groups H, MF and PR, on day 4 - in group CM. In the PR group, the reticulum temperature increased 2 days before calving.

Conclusions: The highest pH and temperature before calving can be as biomarkers of healthy cows after calving. The lowest reticulum temperature before calving, can be as indicator of MF after calving. Positively correlation of reticulum pH and temperature before calving can be as biomarkers of PR.

Keywords: cow, reticulorumen, after calving, diseases.

HH-P03

Effect of age at first calving and parity number on colostrum total solids content

Aikaterini Soufleri[1], Georgios Banos[2], Nikolaos Panousis[3], Georgios Arsenos[1], Georgios E. Valergakis[1].

[1]Laboratory of Animal Husbandry, Faculty of Veterinary Medicine, School of Health Sciences, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece, Thessaloniki, Greece; [2]Laboratory of Animal Husbandry, Faculty of Veterinary Medicine, School of Health Sciences, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece/ Scotland's Rural College/Roslin Institute, Edinburgh, Scotland, UK, Thessaloniki, Greece; [3]Clinic of Farm Animals, Faculty of Veterinary Medicine, School of Health Sciences, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece, Thessaloniki, Greece.

Objectives: Colostrum total solids (TS) is a reliable proxy for its immunoglobulin content and, therefore, its quality. The objective of this study was twofold: a) to evaluate the effect of age at first calving on colostrum TS and b) to test whether colostrum quality of primiparous cows is lower than that of multiparous ones.

Materials and Methods: The study was conducted in 10 commercial dairy herds in Northern Greece, from February 2015 to September 2016. A total of 387 primiparous (27±3.8 months at calving) and 687 multiparous Holstein cows were included in the study. All cows were milked completely 232±195 minutes after calving; colostrum yield was recorded and a sample was collected from each one. A Brix refractometer was used cowside to measure %TS (a value ≥22% is indicative of high quality). Calendar season, parity, age at calving (months), time interval between calving and colostrum collection (TI) and body condition score (BCS) at calving were also recorded. Primiparous cows were grouped by age at first calving as follows: ≤24 months (110 cows), 25-27 months (148 cows), 28-30 months (78 cows) and >30 months (51 cows). All cows were grouped by parity as follows: 1st parity (387 cows), 2nd parity (311 cows), 3rd parity (181 cows) and 4th+ parity (195 cows). Effects of farm, season, age/parity group, colostrum yield (≤4kg, 4.1-8.5kg and >8.5kg), TI (<120min, 120-360min, >360min) and BCS (5-point scale with 0.25-unit increments) on colostrum TS were assessed using univariate linear models. Farm was fitted as a random effect and all other factors as fixed ones in the model. Moreover, percentage of samples with Brix value <22% were calculated for primiparous cows' age groups, for all cows' parity groups, for TI, colostrum yield groups and for BCS. Differences among groups were estimated using a chi-square test.

Results: Age at calving of primiparous cows had no effect on colostrum TS (P>0.05); for age groups of ≤24 months, 25-27 months, 28-30 months and >30 months, mean %(±SD) TS was 26.0±4.4, 26.0±5.1, 26.2±3.7 and 25.5±4.6, respectively. The percentage of samples with Brix value <22% in primiparous age groups were 4.4%, 7.2%, 2.1% and 3.4%, respectively. No statistical difference (P>0.05) was detected among these groups, either. Farm, calendar season, TI and BCS had significant effects (P<0.05) on TS. The latter was highest in autumn and when TI was <360 min. When TI was >360min, 31.0% of samples had values below 22%; respective percentages for <120min and 120-360min were lower, at 11.4% and 14.9% (P<0.05). Primiparous cows with a BCS ≥3.5 had the lowest mean TS (P<0.05) but percentage of samples with Brix value <22% was not affected by BCS. Parity had a significant effect on colostrum TS (P<0.05). Mean %(±SD) TS of parity 1, 2, 3 and 4+ cows was 25.8±4.6, 24.7±4.5, 25.9±4.6 and 27.1±4.8, respectively. The percentage of samples with Brix value <22% in parity 1, 2, 3 and 4+ cows was 17%, 26%, 18% and 13%, respectively (P<0.05). Interestingly, and contrary to common belief, colostrum from 2nd parity cows had an inferior quality than that from primiparous cows. Farm, calendar season, colostrum yield and TI had also a significant effect on TS. Lowest values were observed during spring and summer (P<0.05), when colostrum yield was ≥8.5kg (P<0.05) and TI ≥6h (P<0.05). When yield was >8.5kg, 27.4% of samples had values below 22%; for yield classes ≤4kg and 4.1-8.5kg failure percentages were lower, at 16.8% and 17.3%, respectively (P<0.05). When TI was >360min, 28.0% of samples had values below 22%; respective percentages for <120min and 120-360min were lower, at 15.2% and 18.0% (P<0.05).

Conclusions: Age at calving of primiparous cows had no effect on colostrum TS. Therefore, farmers can continue their efforts to decrease age at first calving up to the suggested 22 months, without worrying about colostrum quality. Moreover, the notion that primiparous cows produce low quality colostrum proved to be false in this study. Colostrum from primiparous cows should not be rejected. Its quality, as that of colostrum from older cows, should be assessed on farm with a Brix refractometer before administration to calves.

Keywords: dairy cow, colostrum, parity.

HH-P04

A pilot study on the association of daily rumination time with fat and muscle mobilization during the transition period in Holstein cows

Nektarios Siachos[1], Nikolaos Panousis[2], Georgios Oikonomou[3], Georgios E. Valergakis[4].

[1]Laboratory of Animal Husbandry, Veterinary Faculty, Aristotle University of Thessaloniki,, Thessaloniki, Greece; [2]Clinic of Farm Animals, Veterinary Faculty, Aristotle University of Thessaloniki, Thessaloniki, Greece; [3]Institute of Veterinary Science, Faculty of Health and Life Sciences, University of Liverpool, Neston, United Kingdom; [4]Laboratory of Animal Husbandry, Veterinary Faculty, Aristotle University of Thessaloniki, Thessaloniki, Greece.

Objective: Daily rumination time (DRT) is mainly associated with NDF intake and under the same feeding management, it represents a proxy of dry matter intake. Optimizing dry matter intake during the pre-partum period is probably the most important strategy for a successful transition. The objective of this study was to investigate the association of DRT with body fat and muscle mobilization during the transition period in dairy cows.

Materials and methods: Thirty-two multiparous Holstein cows in different parities from a commercial dairy farm in Greece were enrolled in this study. Dry cows were housed in a straw bedded barn providing at least 10m² per cow. After calving, cows were moved to a typical 2-row free-stall barn. Cows were equipped with commercial tags (SCR, Israel) recording rumination time in two-hours recording sessions. DRT recordings (min/day) were available from 3 weeks pre-partum to 2 weeks post-partum for each cow. The following parameters were calculated: the areas under the curve for DRT during the pre-partum (AUC_Pre) and the post-partum (AUC_Post) period, the coefficient of DRT variability during the pre-partum period (CV_Pre), and the DRT at day of calving (DRT_Calv). Body condition score (BCS), backfat thickness (BFT) and *longissimus dorsi* muscle thickness (LDT) of each cow was assessed at 5 time-points relative to calving: -21d; -8d; 0d; +8d; +21d, by the first author. Cows were scored for BCS on a 5-point scale with 0.25-unit increments; BFT and LDT were measured by ultrasonography, using a 5.0-7.5 MHz linear transducer. BFT was measured in the pelvic region and LDT on the transverse process of the 4th lumbar vertebra at the site of the larger diameter of the muscle between the fasciae. Fat and muscle mobilization were defined as the decrease in BFT and LDT measurements from -8d to +21d, respectively (ΔBFT and ΔLDT). Medians in ΔBFT and ΔLDT were used as cut-offs to distinguish cows with high from those with low fat or muscle mobilization, respectively. Comparisons between the above groups for DRT parameters were performed with t-tests or Mann-Whitney tests, for normally distributed data or not, respectively. Analysis was performed with IBM SPSS v.25.

Results: Cows had a mean (±sd) BCS =3.34 (±0.52), mean (±sd) BFT =17.33 mm (±6.72) and mean (±sd) LDT =34.81 mm (±5.64) at -21d. Medians for ΔBFT and ΔLDT were 4.4 mm and 12.0 mm, respectively. Cows with low ΔBFT had higher DRT_Calv than cows with high ΔBFT (357 min/d vs. 268 min/d; P=0.019). Moreover, cows with low ΔLDT had higher AUC_Pre (9860 vs. 9059; P=0.022), lower CV_Pre (9.94% vs.

13.95%; P=0.011), higher DRT_Calv (368 min/d vs. 272 min/d; P=0.011) and higher AUC_Post (7378 vs. 6589; P=0.015) than those with high ΔLDT.

Conclusions: Daily rumination time during the transition period is associated with mobilization of body fat and muscle reserves. Thus, rumination time during the pre-partum period and at the day of calving could serve as a tool for predicting the onset and the degree of negative energy and/or protein balance. A larger scale study should aim on identifying cows at high risk for significant fat and/or muscle mobilization from their daily rumination time patterns as early before calving as possible.

Keywords: rumination, transition, backfat, longissimus dorsi, dairy cattle.

HH-P05

Postpartum identification of cows at risk of disease

Giovanni Maria Gnemmi[1], Massimiliano Zocca[2], Alessandro Lazzaro[3], Lorenzo Volatile[4], Elisa Zaniolo[4], Davide Bolognini[5].

[1]Bovinevet Internacional Bovine Ultrasound Services & Herd Management, Huesca, Spain; [2]Fattoria san Rocco s.a, Castelfranco Emilia (BO), Italy; [3]Fattoria San Rocco, Castelfranco Emilia, Italy; [4]Fattoria san Rocco s.a., Castelfranco Emilia (BO), Italy; [5]Bovine Practitioner, Modena, Italy.

Introduction: The consumer requires ever greater transparency in the production of milk and meat and the social sensitivity towards the welfare of production animals and food safety is progressively and steadily increasing. The resistance to antibiotics cannot be underestimated, as well as the need/possibility to achieve productive and reproductive performances, without a systematic use of hormones. The major limitation of modern reproductive management are a low heat detection rate and a low conception rate. These problems are solved only with a different approach of the transition phase reducing the risk of having sick cows in the immediate postpartum and identifying animals at risk as soon as possible.

Objectives: Define an operational strategy capable of highlighting cows at risk of pathology in the first 10 postpartum days. Define a clinical criterion that would allow us to distinguish between a sick animal and a simply symptomatic cow.

Materials & Methods: The pilot test was conducted in a herd of 590 cows in milk in the Parmigiano Reggiano area (province of Bologna), between October 2014 and December 2019. Daily, during the first 10 days in milk, cows are been observed to decide whether to subject them to a clinical visit on the basis of a screening based on front and rear observation. Frontally, the ears are analyzed (position and symmetry of the ears, temperature at the base of the ears, ear infection: purulent, unilateral/bilateral), eyes (shine/corneal opacity, epiphora mono/bilateral, type of epiphora) and the muzzle (dry, wet, nasal discharge: type, odor, mono or bilateral). Behind, the observation was including: the rumen score, the locomotion score and the mobility score, the shape of the abdomen (right side), the frequency and type of breathing (right

side), the mammary system (symmetry, color, edema, odor, size, shape and color of the teats, possible loss of milk), stool (consistency, color, odor, presence of indigestible: type and quantity of indigestible), vaginal discharge (color, odor, consistency), the vagina (presence of lacerations). Each parameter taken into consideration `s was given a score (from 0 to 3 according to the problem) and according to the overall score, each cow as been identify with a color red (score> 23), orange (score 11-23) and yellow (score 0-10). The red cows', must be visited immediately, the orange cows', must be monitored and checked again after 12 hours, while the yellow cows', can be considered normal and/or with a very low risk of developing pathology and therefore will be rechecked after 24 hours. The observation of each individual cow must be completed with the last milking production: cows that do not increase production or that decrease production, must undergo an immediate clinical visit. The score is made on mobile or tablet, which automatically establishes the list of cows that must undergo a clinical visit The postpartum technicians were veterinarians or animal science graduated.

Results: With this system, the animals subjected to daily clinical visits were 5-8% of the total cows hosted in postpartum burn. The consumption of antibiotics in postpartum has been reduced from 30.79% of the total drug cost to 20.26%. This method has accelerated the working procedures, allowing to keep the animals blocked for no more than 60 minutes a day, guaranteeing one of the fundamental principles of cow welfare. Between October 2013 and December 2019, the heat detection rate went from 58.79% to 71.61%, while the pregnancy rate went from 16.98% to 27.65%, also thanks to the introduction of the Double Ovsynch.

Conclusions: This clinical method allows the identification of cows at risk of pathology with great timing and precision. It allows us to distinguish between a sick cow and a symptomatic cow, that is, it allows us to establish a fair principle of use of antibiotics and other drugs. The method was subsequently exported to three other dairy farms, respectively of 800, 1500 and 3500 cows in milk, comparing it with collar/ear tag (SCR) clinical detection systems, demonstrating extreme accuracy. This clinical method of evaluation of postpartum cows, is complementary to the new forms of artificial intelligence, or in their absence, can replace them.

Keywords: Sick cows, Postpartum, early diagnosis.

Farmers say they like vets to be 'proactive' but what do they mean, exactly? Exploring proactive behaviour from a social science perspective

George Giles[1], Emma Fishbourne[2], Robert Smith[2], Helen M Higgins[2].

[1]*Giles & Parsons Farm Vets, Camelford, United Kingdom;* [2]*Institute of Veterinary Science, University of Liverpool, United Kingdom.*

Objectives: Previous work has shown that farmers rate 'proactive vets' higher than many other veterinary attributes, such as clinical knowledge or experience (Jefferson-Loveday

et al, 2019). However, this research did not define proactivity, and while proactivity has been studied by social scientists in other contexts, to our knowledge there is an absolute paucity of studies exploring this construct in the context of the vet-farmer relationship. Set in the context of seasonal calving UK dairy farmers, the aims of this study were to i) explore dairy farmers experiences and perceptions of interactions with their vet that they considered to be proactive in nature (ii) explore any barriers to veterinary involvement on farms.

Methods: Semi-structured telephone interviews were conducted with 12 seasonal calving UK dairy farmers. A snow ball sampling strategy was employed which sought to capture a diversity of opinions. Interviews were audio recorded and transcribed verbatim. An inductive thematic data analysis was performed using NVivo software. The six-phase process described by Braun and Clarke (2006) was followed. Coding and theme generation was led by GG, with refinement following discussion with HMH and EB.

Results: There were 11 male participants and 1 female. Herds were a mixture of spring and autumn blocks, with varying lengths of breeding season from 9-20 weeks. Herd size ranged from approximately 150 – 750 milking cows and were selected from the south west of England, Wales, Herefordshire and Kent. Respondents age ranged from mid-twenties to mid-sixties and the vet practices used ranged from traditional mixed practices to large privately owned farm practices and corporate farm animal practices.

There were 3 themes generated in total. The first theme entitled 'Why farmers *don't* always trust their vet or turn to them for advice' highlighted reasons underpinning some farmers' decisions to not seek out input from their local vet or to act upon the veterinary advice they are given. This theme also included examples of missed opportunities when vets were on the farm and could have engaged with farmers but did not. It also shows that a relationship of trust takes time to build up and that changing vets will disrupt the farmer vet practice relationship. The second theme entitled 'Striking a balance: helping or pushing?' explored the fine line that farmers acknowledged could exist for vets between coming across as supportive versus appearing too forceful in their approach. Listening, timing and understanding farmers goals all featured in this theme. The last theme, 'what proactivity looks like to farmers' provides examples of behaviours vets undertook, or could undertake, that farmers liked and considered to be proactive, as well as behaviours and advice that vets did that annoyed or frustrated them. In general, there appeared to be a dichotomy with regards to farmers perceptions of their vet. In this study, farmers either had little involvement with their vet, questioned their expertise and were frustrated that their vet was not more proactive. Or, they had regular contact with their veterinary practice, valued the input they received and being 'pushed' into action by their vet and considered it helpful to have continual veterinary input to keep them on track.

Conclusions: The results provide useful new insights that can be used by vets in clinical practice to improve the way they interact with their clients, and ultimately help farmers to make changes that prevent and control diseases on their farm. Understanding the types of veterinary behaviours and advice that farmers value the most and consider to be proactive is paramount. Just as important, is to avoid the so-called dark

side of proactivity, as recognised by social scientists. These are behaviours that while unquestionably proactive in nature, nonetheless, on some occasions and in some contexts, prove unhelpful or even counterproductive. Our work is suggestive that this can arise by a lack of intrinsic motivation by the farmer on a certain subject topic, which the veterinary surgeon must identify and then change his/her approach to the perceived problem for there to be a successful outcome.

Keywords: facilitating behaviour change, engagement, proactive.

Prevalence of piroplasmosis in cattle in some grazing reserves in Nigeria

Hassan Mohammed Mai[1], Mohammed Sanusi[1], Abdullahi Kunis Mahmoud[2], Abdulazeez Ahmad[1].

[1]*Abubakar Tafawa Balewa University, Bauchi, Nigeria;* [2]*Ministry of Agriculture (TADP), Taraba, Nigeria.*

Objectives: The Nigerian livestock resources was conservatively estimated to the tone of USD 6 billion and contributes significantly to the Agricultural component of the Gross Domestic Product (GDP) of which cattle production contributes up to 40% . Disease is one of the numerous debilitating factors affective livestock productions in Nigeria which result in substantial economic loses of which piroplasmosis forms an important component. Parasitic diseases have devastating impact on human and animal health worldwide particularly in developing countries. The losses caused by the parasites comprises acute illness, death, premature slaughter, rejection of some body parts at meat inspection and reduction of productive potential such as decreased growth rate, weight loss in young growing animals and late maturity of slaughter stock. The study was carried out to determine the prevalence of piroplasmosis in cattle in some grazing reserves in Taraba State, Nigeria.

Materials and Methods: The study was conducted in six (6) randomly selected gazetted grazing reserves (Sunkani and Dinding in Northern zone, Mayo-Kam and Maihula in Central zone and Gankwe Assen and Jibu in Southern zone) of Taraba State, Nigeria. A total of 1005 blood samples were collected from apparently healthy cattle and examined for the presence *Anaplasma, Babesia* and *Trypanosoma* species using thick and thin blood smear. Identification was carried out to genus and where possible, species level. Information about sex, age, breed and location of cattle were collected using structured questionnaire.

Results: The result revealed overall prevalence of piroplasmosis of 153 (15.2%). The organisms examined were *Babesia, Trypanosoma* and *Anaplasma* species. The *Babesia* species isolated were *Babesia bigemina* (7.2%) and *Babesia bovis* (3.7%) which accounted for 110 (10.9%). *Trypanosoma vivax* (1.5%) and *Trypanosoma congolense* (0.7%) were the two species of *Trypanosoma* 22 (2.2%) identified. Only *Anaplasma marginale* was isolated in the study 21 (2.1%).

In relation to sex, out of the 118 males and 887 females examined, high infection was recorded in females 136 (15.3%) than males 17 (14.4%). On age groups, 948 adults and 57 young cattle were examined, the result showed that the infections are higher in adults than young with 145 (15.3%) and 8 (14.0%) respectively. Based on seasons, 499 and 506 cases were recorded during dry season and rain season respectively. The occurrence of piroplasmosis was found to be higher during the rainy season with 96 (19.0%) and least in the dry season with 57 (11.4%).

Regarding breeds, Rahaji, Bokoloji, Bunaji and Muturu breeds were examined. The highest infection was observed in Bokoloji 10 (16.4%) and no infection in Muturu. The occurrence of the infections based on locations revealed the highest prevalence in northern Taraba 96 (28.5%) with Dinding grazing reserve 58 (34.3%). The least prevalence was recorded in Taraba South 19 (5.7%) with Gankwe Assen 7 (4.2%).

Conclusions: The results confirmed the presence of carrier populations of piroplasmosis in cattle in the study area which may favour the spread of the infections to other susceptible animals and humans. Animals of all sexes and age groups are carrying the diseases. Females are more susceptible because they are kept longer for breeding and milk production purposes while calves have rapid immune responses to primary infection through a complex immune mechanism by colostral immunity. Some of the factors responsible for the spread of the disease include; distinction in geo-climatic condition, increasing the upsurge of tick population and animal exposure to vectors of the diseases. Better control measure against the vectors, regular strategic prophylactic treatment, breeding and improving resistance breeds and development of vaccines against the diseases should be adopted to prevent its spread.

Keywords: Piroplasmosis, Prevalence, Cattle, Grazing reserves.

Influence of the title of agrarian property in the zootechnical practices of beef cattle in Guanajuato, Mexico

Agali Acuña-Garduño, Randy Alexis Jiménez-Jiménez, Miguel Ángel Quiroz Martínez, Valentín Espinosa-Ortiz.

FMVZ-UNAM, Ciudad de México, Mexico.

Objective: Analyze the zootechnical practices carried out by beef cattle producers with and without agricultural property title, in Guanajuato, Mexico, in order to identify how land ownership influences livestock production and zootechnical management.

Material and methods: The study was carried out in six localities located in the municipality of San Luis de La Paz, Guanajuato, Mexico. In the municipality, people who own cattle are governed by different types of agricultural property, mainly by the ejido and private property, and there are also producers who do not have legally official documentation proving the possession of land called "avecindados". Through

non-probabilistic sampling, three localities with title of agrarian property (ejidatarios) and three without title of agrarian property (avecindados) were chosen; through the snowball method in the six localities 65 farmers were surveyed: 40 ejidatarios and 25 avecindados, which were available to participate in the study. The information was collected through semi-structured interviews and participant observation. The survey considered aspects related to the main zootechnical practices: genetics, reproduction, food practices, health and economics. With the information obtained, a frequency analysis was performed in Microsoft Excel.

Results: The main differences in zootechnical practices between ejidatarios and avecindados were: in genetics, the ejidatarios (44%) prefer the crossbreeding of charolais, zebu and native breeds, while 48% of avecindados are oriented more towards the racial purity of cattle Charolais; in reproduction, the ejidatarios (43%) are oriented to make a change of sire from 1 to 3 years, while the avecindados (34%) do so from 4 years onwards; in the feeding it was observed that in 25% of the ejidatarios tend to incorporate technological practices in the conservation of forages such as silage; in preventive medicine, 90% of ejidatarios vaccinate 1 to 2 times a year, while only 54% of avecindados have done so, for deworming 85% of ejidatarios and 54% avecindados do it frequently, and the application of vitamins, 88% of ejidatarios and 50% of avecindados do it; in the commercialization, it was obtained that 39% of the ejidatarios sells mainly calves and waste cows, while 36% of avecindados only sell cows; In other zootechnical practices, it was identified that 41% of ejidatarios keep records and none of avecindados do this practice. These differences may be due to 50% of ejidatarios having access to technical advice through the state extension program.

Conclusions: The study showed that although the avecindados do not have any legally official documentation, this is not a limitation to carry out the livestock activity, since it uses abandoned and idle land in the region. However, there are differences in zootechnical practices that can be reflected in the productive conditions of cattle, a situation granted by technology transfer program that they receive from the state, thanks to the agricultural rights they possess.

Keywords: livestock production practices, technology transfer, agricultural rights.

HH-P09

The selection of Johnes Disease Control Strategies for dairy herds engaged in the UK National Johnes Management Plan

Richard Sibley[1], Pete Orpin[2].

[1]*West Ridge Veterinary Practice, Witheridge, United Kingdom;* [2]*Myhealthyherd.com, Leicester, United Kingdom.*

Objectives: The UK National Johnes Management Plan requires participating farms to select one of six control strategies to manage Johnes disease in their herds. This study looks at the strategy selection in over 2400 herds that are participating in the scheme, and investigates the selection ac-

cording to Johnes Disease risk and status.

Materials and Methods: 2462 dairy herds are using a web based herd health management programme to engage in the UK National Johnes Management Plan, and comply with the requirements to asses risks, determine disease status and select an appropriate prevention and control strategy with the help of a trained Accredited Johnes Advisor.

Results: In this set of herds, 58% of herds have selected a strategy of managing Johnes disease using strategic testing, 17% use a test and cull strategy, 12% use improved farm management without testing and 5% selected biosecurity and monitoring to protect their herds. Only 0.5% use vaccination, and 5% breed to a terminal sire to control the disease.

Conclusions: Herds with high risks of Johnes disease are likely to select the resource intensive strategies designed to deal with high prevalence such as frequent strategic testing and risk management (63%), whilst herds with low disease risks are more likely to select less onerous strategies such as biosecurity, protect and monitor (27%), tests and cull (27%).

The strategic options for control are an important part of the UK National Johnes Management Plan, allowing trained and accredited veterinary advisors to select the most appropriate control program for herds dependent upon risk, status and resource. The results of this study show that appropriate strategies are being selected to ensure continued engagement and economic benefit.

Keywords: Johnes, management. control strategies.

HH-P10

Preliminary study: Factors influencing dystocia and stillbirth on four east-german dairy cattle farms

Lilli Bittner, Barbara Prottengeier, Fanny Ebert, Alexander Starke.

Clinic for Ruminants and Swine, Faculty of Veterinary Medicine, University of Leipzig, Leipzig, Germany.

Dystocia and stillbirth have negative effects on the following production period and cause direct losses, therefore they are of considerable economic importance for the farmer. The problem is well known, however still around 6 - 8% of dairy calves are born dead or die shortly after delivery.

Objective: Sex, parity of the dam, season of birth and monitoring intensity are a few factors influencing stillbirth and dystocia rates on a farm, and we aimed to analyze some of them on four large east german dairy farms.

Materials and Methods: In a retrospective observational study on four farms in eastern Germany we analyzed calving data submitted by the farmers to the herd management software "Herde" (dsp agrosoft). 7314 calving's over 22 months were included, and data to parity of the dam, stillbirth rate and ease of calving were collected. For calving ease 3 grades were distinguished. Grade 1 without assistance, grade 2 easy pull and grade 3 heavy pull and veterinary assisted calving's. Dystocia rate was calculated as percentage of calvings with a grade 3 calving. Stillbirth rate was calculated as percentage of

calves born dead or dying within 24 h after birth.

Results: Dystocia occurred in 1 - 6% (Mean 2.4%) of the calvings and stillbirth rate was calculated to be 4 - 6% (Mean 5.2%). In male calves, dystocia rates were 2 – 8% (Mean 3.5%) and stillbirth rates for male offsprings was 5-10% (Mean 6.3%). Female calves were born in 1 - 4% (Mean 1.75%) under dystocic conditions and stillbirth rates were 4-5% (Mean 4.25%) (P>0.05). In heifers dystocia occurred with 1 - 8% (Mean 3.5%) of the calvings whereas in cows in with 1 - 4% (Mean 2.0) (P>0.05). Stillbirth rates for heifers were with 3-7 % (Mean 4.7%) similar to cows (Mean 4.9) (P>0.05). Further analyses showed that in dystotic calvings the stillbirth rate was higher (Mean 39.25%) than in eutotic calvings (Mean 3.25%) (P<0.05).

In *conclusion*, in our preliminary study, in a limited number of farms, classical factors favoring stillbirth as parity of the dam and sex of the calve might not be the only main risk factors, and herd specific factors need to be studied more in detail. Further studies with a larger number of farms are necessary.

Keywords: Calving, eutocia, heifer.

Effect of a monensin controlled-release capsule on milk production and methane emissions of dairy cows

Juan Cainzos[1], Leane Oliveira[1], Kate Parsons Sharon[1], Marcello Guadagnini[2], Ramiro Fouz[3].

[1]*Elanco Animal Health, Greenfield, United States;* [2]*Elanco Animal Health, Sesto Fiorentino, Italy;* [3]*Africor Lugo, Lugo, Spain.*

The objective of this study was to evaluate monensin controlled release capsule (Kexxtone™, Elanco Animal Health) impact on milk production and methane emissions (CH4) up to 90 days in milk (DIM) in dairy cows at the first two Dairy Herd Improvement (DHI – Africor Lugo) tests after calving. Individual information about farm identification, cow number, parity, days in milk, and milk yield at DHI tests (DHI 1 was performed between 5 to 35 DIM; and DHI 2 was performed ≤ 90 DIM) were recorded. In addition, milk samples (bronopol preserved) were collected and analyzed for somatic cell count (SCC), fat%, protein% and fatty acid profile at Laboratorio Interprofesional do Leite de Galicia (LIGAL; A Coruña – Spain). Chillard et al., (2009) indicated that milk fatty acid profile could be considered as a potential indicator of *in vivo* CH4 output reporting different predictive equations. CH4 emissions were estimated based on the following formula: CH4 (gr/cow/day) = 16.8 x Milk 16:0 (% Total Fatty Acids) – 77 (r^2=0.82, Chillard et al. (2009). Animals were enrolled during the dry period and data was collected from January to October of 2017. Season was defined as summer (April to September) and winter (October to March). All data were analyzed with PROC MIXED (SAS 9.4, Kenward Rogers ddfm) and included the fixed effects of treatment, season, and treatment x season and the random effects of farm, parity, and DIM. Number of treated cows differed among farms (range: 9 to 126), but each farm enrolled between 25 up to 75% of total cows. A total of 1429 cows

from 18 commercial dairy herds from Lugo province (Galicia, Spain) were enrolled in this study. A total of 796 cows received monensin in controlled-release capsules 3 to 4 weeks prior to expected calving date, and 633 did not receive any treatment (control group). Treatment with monensin increased milk production by 1.8 Kg/ day at DHI 1 (*p-value* = 0.001) and by 3.3 Kg/day at DHI 2 (*p-value* <0.001) compared to control group. Cows from control group produced more estimated CH4 compared to cows treated with monensin (354 g/cow/day versus 344 g/cow/day, respectively; *p-value* = 0.012) at DHI 1. However, there was no difference for estimated CH4 between control and treated groups at DHI 2 (416 g/cow/day versus 412 g/cow/day, respectively, *p-value* = 0.367). At DHI 2, cows produced greater estimated CH4 during winter compared to summer (*p-value* = 0.003). Monensin increased total fatty acids at DHI 1 compared to control group (*p-value* = 0.004) but there was no difference at DHI 2. In conclusion, monensin decreased estimated CH4 emission at first milk test after calving and increased milk production during first two tests.

References:

Y. Chilliard, C. Martin, J. Rouel, M. Doreau. 2009. Milk fatty acids in dairy cows fed whole crude linseed, extruded linseed, or linseed oil, and their relationship with methane output. J. Dairy Sci., 92, pp. 5199-5.

Keywords: Methane, milk yield.

What are the areas of greatest opportunity in the dairy cows' management around calving in CEE farms?

Marcin Kocik[1], Wojciech Skupien[2], Gerhard Zechner[3], Ashley Hayden Gunn[4], Juan Cainzos[4].

[1]*Elanco Animal Health, CEE and REU, Poland, Poland;* [2]*Elanco Animal Health, Poland, Poland, Poland;* [3]*Independent, Salzburg, Austria;* [4]*Elanco Animal Health, Greenfield, United States.*

The 90 days period (V90D, beginning approximately 60 days prior to calving and continues through the first 30 days of lactation) represents key period of the success of future lactation (Rapnicki and Overton 2014). Housing and facilities, feeding and handling management during V90P have a direct impact on the health and well-being of holidays in transition and, consequently on their future productivity and fertility (Norlund 2005, 2009). Evaluation of those variables would provide to the veterinarian the opportunity to advise their farmers about design and management in order to cover the cow's needs during transition period (Cook and Nordlund 2004).

The risk analysis tool (*dRisk*™ Risk Assessment Tool, Elanco Animal Health) allows the management evaluation during the dry, close-up and post-partum period at farm level, by developing a 65-75 question survey about aspects related to facilities, food and handling management.

Objective and material and methods: With the aim of evaluate the far dry, close-up and maternity and fresh cows management in Easter Europe countries dairy farms, dRisk analysis was implemented in 124 dairy farms (Turkey=5, Po-

land=80, Hungary=6, Greece=3, Estonia=3, Czech Republic=22, Cyprus=1 and Bulgary=4).

Results: Those farms had, on average, 344 milking cows (range: 24-3500) and 40 dry cows (range: 2- 609), at inclusion date. 35% of farms involved (n=44) had separated prepartum facilities and 61.29% (n=76) had a separate calving pen. Bedded pack was the most common housing system for both Far dry (n=63) and Close up pens (52), followed by free stalls (n=42 and 23) and Dry Lots/pasture (n=18 and 5, respectively). Only 1 farm had dry cows on pasture. Main housing system used for maternity and fresh cow was free stall (n=87) and bedded pack (34). 2 farms used dry lots/pasture pens for maternity and fresh cows.

General evaluation of the conditions of those farms shown that the area with more improvement opportunites (fewer farms having optimal conditions) was dry period. So, 73.39% of the farms had poor housing conditions and facilities (n=21) or improvable (n=70) and only 26.61% (n = 33) of the farms visited the drying facilities met the optimal conditions. In addition, in 78.23% of farms, management of dry cow feeding was precarious (n=76) or improvable (n=21). On the opposite, postpartum period management was optimal in 74.19% (n=92) of the farms visited, and in only three of them it was precarious. Regarding with the postpartum facilities and nutrition, in 10.48 and 5.65% of the farms (n = 13 and 7, respectively) conditions were precarious, in 52.42 and 59.68% (n=65 and 74, respectively) could be improved and only 37.10 and 34,68% (n=46 and 43, respectively) of the farms had optimal conditions.

The main critical points more frequently repeated for each area were also analyzed. Thus, for far dry and close up period, the most frequent critical points were a) limited access to drinking water (lower that 4 " linear water access per cow; not clean water or less than 2 locations in pen, n = 99), b) high body condition score (> 10% of cows had BCS in 5 points scale > 4.0, n = 74), c) cows and heifers were housed together (n = 73). The most frequent critical points in maternity and fresh pens were a) limited access to drinking water (lower that 4 " linear water access per cow; not clean water or less than 2 locations in pen, n = 95), b) cows and heifers were housed together (n = 91) and c) limited bunk space (<30 "of feed bunk access / cow, n = 82).

In conclusion, this work shows that there is ample room for improvement in the conditions of housing, management and feeding of cows during the transition period, especially in the dry cows group. Evaluating the conditions of the animals of this period gives the veterinarian the opportunity to advise their farmers about the improvements that may have a greater impact on the health and welfare of the cows and, consequently, on their future productivity and fertility. Doing so in a rigorous and standardized way allows you to compare the conditions of the different farms, monitor and establish the possible relationships between the driving conditions and the productive and reproductive parameters.

Keywords: Management, Dairy, Facilites, Transition.

Evaluation of IgG concentration and bacterial load of bovine colostrum in the Benelux region

P.A.A. Penterman[1], G. Hoflack[2], G. Vertenten[1], B. Sustronck[2].

[1]MSD Animal Health, Boxmeer, Netherlands; [2]MSD Animal Health, Brussels, Belgium.

Objectives: Ingestion of sufficient amounts of good quality colostrum in the first hours of life is essential for the future health and performance of the calf. Colostrum quality reflected by its immunoglobulin G (IgG) concentration and its bacterial load can vary widely among cows. The qualitative standards for bovine colostrum are set at an IgG concentration of at least 50 g/l and a maximal total bacterial cell count of 100.000 CFU/ml. To our knowledge, there has been no recent peer-reviewed study evaluating the quality of colostrum from cattle in the Benelux region. The aim of the present study is to evaluate the colostrum quality, defined as IgG concentration and the total bacterial count, from cattle in the Benelux.

Materials & Methods: For this study bovine practitioners were invited to participate in the collection of colostrum from freshly calved cows. On 88 commercial farms located in Belgium and The Netherlands, a total of 162 colostrum samples were collected. Sampling occurred at the first feeding of colostrum to the calves. Colostrum samples were stored at -20°C until processing. IgG concentrations were measured using a commercial competitive ELISA-test kit (BIO K420, Mono-Screen QuantELISA Immunoglobulin Easy, Bio-X Diagnostics S.A., Rochefort, Belgium). Total bacterial cell count was determined using a bactoscan automatic bacterial count reader (Bactoscan™ FC+, FOSS, Denmark). Colostrum samples with IgG concentrations < 50 g/l or with a total bacterial cell count of > 100.000 CFU/ml were considered of low-quality. All analyses were performed using R software (R Core Team, 2017).

Results: The number of colostrum samples collected per herd ranged from 1 to 5. Colostral IgG concentrations were normally distributed with a mean of 66,4 ± 25,5 g IgG/l (range 14,4 – 150,0 g IgG/l). The bactoscan method resulted in a median total bacterial cell count of 7.000 CFU/ml (range 4.000 – 1.000.000 CFU/ml).

Based on an IgG concentration of at least 50 g/l, 22,3 % of the colostrum samples were of poor quality. Total bacterial cell count was above the norm of 100.000 CFU/ml in 10.2 % of the colostrum samples. Taking both quality parameters into account, 26,8 % of the colostrum samples were of low-quality.

Conclusion: The quality of bovine colostrum in the Benelux region can be improved, considering that nearly one third of the colostrum samples were classified as inadequate to be fed to newborn calves.

Keywords: Cattle, Colostrum, IgG concentration, Total bacterial count.

HH-P14

Bayesian latent class analysis of the characteristics of three diagnostic tests to assess the passive immunity transfer status in neonatal dairy calves

Geert Hoflack[1], Maude Lebrun[1], Bart Sustronck[1], Geert Vertenten[2], Bart Pardon[3].

[1]MSD Animal Health, Brussels, Belgium; [2]MSD Animal Health, Boxmeer, Netherlands; [3]Department of Large Animal Internal Medicine, Faculty of Veterinary Medicine, Ghent University, Ghent, Belgium.

Objective: The assessment of diagnostic tests for the evaluation of failure of passive transfer (FPT) in calves is usually performed applying the radial immunodiffusion (RID) test as the gold standard. The value of the RID test as gold standard is, however, debatable. The main objective of the study was to determine the diagnostic test parameters of three different tests for the evaluation of FPT in the absence of a gold standard applying a Bayesian latent class model. A second objective was to obtain prevalence data on FPT in dairy calves in Belgium.

Materials & Methods: Neonatal dairy calves (n = 95) from 6 commercial farms in Belgium were randomly selected to be enrolled in the study. Only calves aging between 2 and 7 days were eligible to be included in the trial. All enrolled calves had received at least 2L of colostrum in the first 24 h of life. Serum samples were tested by digital brix refractometry and by lateral flow sandwich immuno-chromatography for the evaluation of FPT according to the manufacturer's instructions. An independent, accredited lab (Zoolyx, Aalst, Belgium) performed serum electrophoresis. Failure of passive Transfer was considered as the positive outcome in all interpretations of the test results. In the serum electrophoresis, the concentration of the serum gamma-globulins was used as a proxy of the IgG concentration as described by Pardon et al. (2015). Pardon et al. proposed a cut-off value for FPT of < 10g/L of gamma-globulins in 2 to 7-day old calves. In the present study, this proposed cut-off value was applied, but additionally a cut-off value of 12g/l serum gamma-globulins was evaluated. For the digital brix refractometry data, the study by Elsohaby et al. (2015) was used as reference in which a cut-off value of < 8,3% brix indicated FPT. The cut-off value applied for the lateral flow sandwich immuno-chromatography method was the one proposed by the manufacturer, namely IgG < 10g/l indicating FPT. For the purpose of the Bayesian multivariable latent class analysis of three conditionally independent diagnostic tests, prior distributions of the prevalence and sensitivity and specificity of each diagnostic test were determined according to Dendukuri et al. (2009).

Results: The mean age of the calves at sampling was 3,5 days (SD ± 1,6). The median and 95% credibility interval (CI) for the prevalence of FPT was 48.2 (95% CI: 27.4-67.4%). The Bayesian multivariable latent class analysis of the characteristics of the three diagnostic tests indicated that the best combination of sensitivity and specificity was obtained with the digital brix refractometry method. Depending on the cut-off used for the electrophoresis, the sensitivity of the digital brix refractometry method varied between 83% (95%CI 69,2-93,0%) and 90,7% (95%CI 80,9-96,6%) and its specificity between 74,8%

(95%CI 60,4-87,7%) and 84,9% (95%CI 73,2-92,4%). The commercial lateral flow sandwich immuno-chromatography test showed a very low sensitivity (34,5%, 95%CI 20,3-52,6) which resulted in a large percentage of false negative results. For the practitioner, the negative predictive value (NPV) of a test for FPT ("if the test indicates 'no FPT' how sure can I be that the calf is ok?") is the most important. Taking this into consideration, the commercial lateral flow immuno-chromatography method scored very poorly (NPV 61%, 95%CI 41-81%). Also, the NPV (71%, 95%CI 46-95%) of the serum electrophoresis is rather low when the cut-off value of 10g/L gamma-globulins was applied. Increasing this cut-off value to 12 g/L drastically improved the NPV (96%, 95%CI 81-99%) of the serum electrophoresis.

Conclusion: Our results indicate that, of the different test methods assessed, the best characteristics were obtained using the brix refractometry method for the evaluation of FPT in neonatal calves applying a cut-off value of 8,3% brix. The highest NPV, however, was recorded for the serum electrophoresis using a cut-off value of 12 g/L of gamma-globulins.

Keywords: failure of passive transfer, diagnostic tests, neonatal calves, Bayesian analysis.

HH-P15

Does the position of the food bucket (inside or outside the hutch) affect food consumption and growth in pre-weaning calves?

Eva Mainau[1], Elena Navarro[2], Adriana Siurana[3], Xavier Manteca[3].

[1]AWEC, Barcelona, Spain; [2]Làctia Agroalimentaria, Gerona, Spain; [3]UAB, Barcelona, Spain.

The aim of the present study was to evaluate the effect of the position of the food bucket (inside or outside the hutch) on the feed intake and growth in pre-weaning calves kept in individual outdoor hutches. The study was conducted from October 2018 to June 2019 on a commercial dairy farm in Girona (Spain). Mean environmental temperature ranged from 2 ºC to 26 ºC, relative humidity from 22 % to 100 % and monthly rainfall from 30 mm. to 85 mm. A total of 151 female Friesian calves from the first day of life to weaning were studied. Calves were separated from their dams as soon as possible after calving. Afterwards, calves were kept in individual outdoor hutches bedded with straw bedding and randomly allocated into two different treatments that differed in the bucket position: bucket inside the hutch next to the resting area (IN group, n= 63) or bucket outside the hutch covered with a metal lid (OUT group, n=88). All calves received 4L of colostrum by oesophageal feeder tube and were fed pasteurized milk from the tank twice daily (4L each meal). Fresh water was offered ad libitum to calves after the first day of life. Calves were offered 300g of starter diet from 7 days of age onwards (week 2). The starter died consist of concentrate mixture with a 23.1% of protein and 18.5% of fibre. Every day, food was checked and changed ensuring that calves were fed ad libitum. Weaning was done at 8 weeks of life if calves reached a body weight

(BW) ≥ 80 Kg. A total of 121 calves were weaned as expected at 8 weeks of life, and 30 calves were weaned one week later than expected. Every day, the starter diet was weighted in order to obtain daily food intake from week 2 after birth to weaning. Calves were individually weighted at birth and every week from birth to weaning. Calves tended to eat more starter food when the bucket was allocated inside the hutch in week 2 (36.3 ± 3.5 g/day in the IN group vs. 14.1 ± 1.71 g/d in the OUT group; P=0.0512) and week 3 (92.3 ± 7.86 g/day in the IN group vs. 56.6 ± 2.77 g/d in the OUT group; P=0.0985) after birth. From week 4 to weaning, calves ate a similar quantity of starter food. Similarly, calves with delayed expected weaning tended to consume more starter food when the bucket was allocated inside the hutch but only in week 2 (P=0.0627). These tendencies were statistically significant when calves with non-delayed expected weaning were studied. Calves with non-delayed expected weaning significantly consumed more starter food when the bucket was allocated inside the hutch in week 2 (41.6 ± 4.15 g/d in the IN group vs. 16.3 ± 2.20 g/d in the OUT group; P=0.0004), week 3 (103.1 ± 9.22 g/d in the IN group vs. 60.2 ± 3.21 g/d in the OUT group; P=0.0019) and week 4 (153.1 ± 10.3 g/d in the IN group vs. 107.3 ± 4.96 g/d in the OUT group; P=0.0246) after birth. There was no interaction between the position of the food bucket and the time needed to wean calves. BW and Average Daily Gain (ADG) were not affected by treatment group from birth to weaning. Although ADG from week 2 to week 5 showed higher absolute values in the IN group (week 2: 548.0 ± 38.76 g/d and week 5: 903.9 ± 68.79 g/d) compared with the OUT group (week 2: 504.9 ± 34.8 g/d and week 5: 886.3 ± 73.60 g/d), these differences were not statistically significant. When calves are allocated in outdoor hutches, placing the food bucket inside the hutch increases food consumption until the fourth week of life. Factors such as the proximity of the bucket to the resting area or the fact that food is better protected from climatic conditions when the bucket is inside the hutch may enhance food consumption during the first weeks of life. Nevertheless, BW and ADG were not affected by the position of the bucket.

Keywords: Calves, Consumption, Growth.

Blood metabolism in Holstein calves fed milk replacer twice *vs.* thrice per day

Ángel Revilla-Ruiz[1], Eduardo De Mercado[2], Alejandro Pérez-Navarro[3], Andrea López-Saturnino[4], Patricia Carulla[5], Adrián Ramón-Moragues[5], M Luz Pérez Solana[2], Sonia Pérez-Garnelo[2], Arantxa Villagrá[5], Francisco Sebastián[3], Susana Astiz[2].

[1]Medicine and Surgery Department, Veterinary Faculty, Complutense University of Madrid, Puerta de Hierro Avenue s/n, 28040 Madrid, Spain; [2]Animal Reproduction, INIA-CSIC, Madrid, Spain; [3]COWVET, Valencia, Spain; [4]Facultad de Veterinaria, UCM, Madrid, Spain; [5]IVIA, Valencia, Spain.

Objectives: Lactation is critical for the growth and health of cattle and nutritional strategies during this period can affect the subsequent development of the animal. Historically,

calves have been fed twice a day. However, calves nurse their mothers more than 6 times per day. Therefore, our aim was to evaluate the effect of an isocaloric diet of 6l of milk replacer, fed two *versus* three times per day, on the metabolic status of diary claves at moments associated with stress peaks: weaning and grouping.

Material & methods: We included in the study 140 calves from a commercial rearing farm (Cowvet SL) in Valencia, Spain, between 5 and 38 days of age at entry, randomly distributed (block randomization controlling farm of origin and entry weight) into two feedings per day group "2Fd" (n=71) or "3Fd" group (n=69). The calves were fed 6l daily of milk replacer without casein, formulated specifically for the farm (7% protein, 17% fat, 0.1% fiber; 1% calcium,: 0.6% phosphorus and all recommended trace elements and vitamins) until weaning. The calves had *ad libitum* starter and water from the day of entry.

Blood sampled were taken at four moments. 1) Farm Entry (28.87±8.35; days old); 2) Pre-Weaning (49.54±5.94d); 3) one-week Post-Weaning (66.74±8.2d) and 4) "Grouping" 10 days after having been grouped in batches of 24 (140.78±19.33d).

Serum was assessed with clinical chemistry analyzer (Konelab 20; Thermo Fisher Scientific, Waltham, MA, USA) according to manufacturer's instructions. Serum total cholesterol (TC, mg/dL), triglycerides (TG, mg/dL), high density lipoprotein cholesterol (HDL-C, mg/dL), low-DL-C (LDL-C, mg/dL), glucose (GLU, mg/dL), fructosamine (FRU, mg/dL), lactate (LAC, mg/dL), β hydroxy butyrate (BHB, mmol/L), non-esterified-fatty acid (NEFA mmol/L) and urea (mg/mL) were measured.

We analyzed the effect between 2Fd and 3Fd groups at each time point using non-parametric tests (non-normal distributed variables). Differences over time and interactions between factors were assessed with repeated measures ANOVA, including weight and age at entry as covariates (IBM SPSS® Statistics v. 25.0). Data are expressed as mean ± standard deviation.

Results: Serum parameters were within physiological ranges described for cattle at all assessment moments. When age at entry resulted significantly (*P*<0.05) affecting the parameters, it was kept in the model of repeated measures. No metabolic parameter differed significantly between treatments at moments of Entry, Post-Weaning and Grouping. At Pre-Weaning, we observed significant differences (*P*<0.05) in NEFA (0.25±0.007 *vs.* 0.22±0.08), LAC (16.65±8.48 *vs.* 13.88±6.4), GLU (115.94±18.56 *vs.* 108.37±16.58) and TC (86.71±16.44 *vs.* 81.25±18.94 for 2Fd and 3Fd, respectively). These results indicate that metabolically, feeding three times per day induces a lower mobilization of metabolites related to energy metabolism, which may reflect a greater metabolic stability than calves fed twice a day. This effect is overcome one week after weaning, so it seems to be an immediate effect, while the calves are drinking milk, but not long-term. The repeated measures analysis detected significant differences in parameters related to energy-gluconic metabolism, specifically, in FRU (between Post-Weaning and Grouping), increasing for treatment 3Fd (from 328.2±68.34 to 344.5±83.25) but remaining steady in the group 2Fd (from 330.29±61.11 to 329.75±66.58); and GLU between Entry and Pre-Weaning, decreasing in group 3Fd (from 112.71±18.16 to 108.37±16.58) but being

stable in group 2Fd (from 116.25±17.27 to 115.94±18.56). Between Post-Weaning and Grouping, GLU increased in the two treatments (from 116.25±17.27 to 115.94±18.56 for 2Fd, and from 116.25±17.27 to 115.94±18.56 for 3Fd).

Conclusions: The nutritional regimen of three feedings/day induces a more stable lipid metabolism in Holstein calves, but only until weaning, with this difference disappearing medium-term.

Keywords: Palabras clave: blood metabolism, Rearing, Dairy, performance.

HH-P17

Blood metabolic parameters in Holstein rearing calves up to 4.5m of age according to health status at entry

Ángel Revilla-Ruiz[1], Eduardo De Mercado[2], Alejandro Pérez-Navarro[3], Andrea López-Saturnino[4], Patricia Carulla[5], Adrián Ramón-Moragues[5], M Luz Pérez Solana[2], Sonia Pérez-Garnelo[2], Arantxa Villagrá[5], Francisco Sebastián[3], Susana Astiz[2].

[1]Medicine and Surgery Department, Veterinary Faculty, Complutense University of Madrid, Puerta de Hierro Avenue s/n, 28040 Madrid, Spain; [2]Animal Reproduction, INIA-CSIC, Madrid, Spain; [3]Cowvet SL, Valencia, Spain; [4]Facultad de Veterinaria, UCM, Madrid, Spain; [5]IVIA, Valencia, Spain.

Objectives: The health status at very early stages of life can long-term affect subsequent productivity and growth. Usually, at farm entry, the health status of the animals is determined, using a "calf health score" (HSc; Wisconsin Health-Score; Mahendran et al., 2017, which evaluates different health aspects simultaneously (rectal temperature, cough, nasal discharge, eye discharge, ear posture and fecal score), indicating a higher score with worse health status (0-21). The aim of this study was to evaluate plasma metabolism over time, especially at stress peaks: weaning and grouping, in dairy calves with different health score values at farm-entry.

Material & methods: We randomly selected 235 calves from a commercial rearing-farm (Cowvet SL), Valencia, with an entry age of 5–38 days. All animals were evaluated by a modified version of the Wisconsin-Health-Score, and categorized into three study groups: HSc1 (HSc value=1; n=70), HSc2(value=2; n=128) and HSc3(value=3; n=37). We did not select calves with a value> 3 (only 5 individuals).

Blood was sampled at four moments. 1) Farm-Entry (22.94±7.8; days old); 2) Pre-Weaning (49.63±9.4d); 3) one-week Post-Weaning (65.84±8.6d) and 4) "Grouping": 10 days after having been grouped in batches of 24 (137.54±17.8d).

Serum was assessed with clinical chemistry analyzer (Konelab 20; Thermo Fisher Scientific, Waltham, MA, USA) according to manufacturer's instructions. Serum total cholesterol (TC, mg/dL), triglycerides (TG, mg/dL), high density lipoprotein cholesterol (HDL-C, mg/dL), low-DL-C (LDL-C, mg/dL), glucose (GLU, mg/dL), fructosamine (FRU, mg/dL), lactate (LAC, mg/dL), β hydroxy butyrate (BHB, mmol/L), non-esterified-fatty acid (NEFA mmol/L) and urea (UR, mg/mL) were measured.

We analyzed the effect among groups at each time point and over time using ANOVA and Tukey test for the means comparison ($P<0.05$; SAS® 9.0). Data are expressed as mean ± standard deviation.

Results: Serum parameters were within physiological ranges at all assessment moments. At Entry urea values showed significant differences ($P<0.05$), increasing with HSc (12.3± 5[a]; 14.5± 6.9[ab]; 18.2± 10.3[b] for HSc1, HSc2 and HSc3, respectively). Pre-Weaning was the moment where we detected more metabolic differences among health-groups, with UR (14±6.2[a]; 17.3±5.9[b]; 16.4±5.1[ab]; for HSc1, HSc2 and HSc3, respectively), LAC (13.1±5.1[a]; 16.9±9.1[b]; 13.9±6[ab]; for HSc1, HSc2 and HSc3, respectively), GLU (117±18.3[a]; 107.5±17.8[ab]; 104.3±11.2[b]; for HSc1, HSc2 and HSc3, respectively) and CHO (87.2±21.1[a]; 83.3±15.1[ab]; 71.1±12[b]; for HSc1, HSc2 and HSc3, respectively) being different. However, later, we did not observe differences at any metabolic parameter. This reflects the increased metabolic challenge of reduced health status, with values related to protein metabolism (urea) and stress (lactate) being higher in calves with higher HSc. Glucose and fat metabolism was lower in calves with less health, which may reflect a lower energy availability, probably due to the higher energy costs attributable to inflammatory and pro-inflammatory states.

Regarding the study over time, some variables showed a different evolution over time according to HSc at entry: Urea in HSc1 and 2-groups increased significantly up to Grouping, while HSc3 did not vary over time (HSc1: 12.3±5[a], 14±6.2[a], 15.7±5.6[a] and 20.9±7.5[b]; HSc2: 14.5±6.9[a], 17.3±5.9[a], 16.1±5.7[a] and 22±8.9[b]; HSc3: 18.2±10.3, 16.4±5.1, 18.6±6.3 and 20.43±3.9, for Entry, Pre-Weaning, Post-Weaning and Grouping respectively). The urea increase is expected with time, according to the muscular growth. However, in the less healthy animals, urea requirements are higher since the very early moment. Finally, no significant difference was found in metabolic parameters after weaning, among health-groups, reflecting the similar health scores achieved among groups after weaning.

Conclusions: An inadequate health status at rearing-farm entry is associated with a higher metabolic challenge in the calves up to weaning, even with low HSc scores. However, it seems that under an adequate environment and management, those calves can recover all parameters to physiological levels in weeks.

References:

Mahendran, S.A., Booth, R., Beekhuis, L., Manning, A., Blackmore, T., Vanhoudt, A., Bell, N. 2017. Assessing the effects of weekly preweaning health scores on dairy calf mortality and productivity parameters: cohort study. Vet. Rec. 181(8): 196. doi: 10.1136/vr.104197.

Keywords: metabolism, energy challenge, Health Score, Dairy, weaning.

The first survey of bioexclusion practices on dairy farms engaged in contract heifer rearing

Marie-Claire Mccarthy[1], Luke O'grady[2], Conor Mcaloon[2], John F Mee[3].

[1]Teagasc (and currently DAFM), Fermoy, Republic of Ireland; [2]UCD, Dublin, Republic of Ireland; [3]Teagasc, Moorepark Research Centre, Republic of Ireland.

Objectives: Abolition of EU milk quotas has triggered a period of expansion in Ireland's dairy industry; dairy cow numbers increased by 34% between 2010 and 2018. This has resulted in increased uptake of contract heifer rearing services. Contract rearing is a collaborative farming practice where heifers are moved from their source dairy farm to be reared at a contract rearing farm for an agreed duration and fee. By moving heifers off the milking platform, land and labour resources can be focused on the milking herd. However, contract rearing increases animal movements, and animal movement is the most significant route for disease transmission. So, contract rearing poses a potential threat to herd health and biosecurity. Hence, the objective of this study was to compare bio-exclusion practices (measures taken to exclude pathogens from the farm) used by source dairy farmers (SDFs) and farmers rearing their own heifers (control farmers; CFs).

Materials and methods: In total, 66 SDFs and 54 CFs were recruited to a wider nationwide longitudinal study investigating the animal disease risks associated with contract heifer rearing. These 120 farmers were surveyed by postal questionnaire between September and November 2018 to identify bio-exclusion practices as part of a larger survey to establish herd management and wider biosecurity practices. Questions relating to bio-exclusion practices (n=25) were selected for inclusion in the survey following an extensive review of published literature and consultation with a biosecurity expert group. From the original cohort of farmers recruited to the study, 94% and 91% of SDFs and CFs returned their postal survey pack, respectively. The results from the farm characteristics, management and bio-exclusion practices questions are reported here.

Results: The average herd size was 198 cows (60-380) for SDFs and 146 cows (60-501) for CFs. The majority of farmers from both cohorts (93% SDFs, 92% CFs) provided a foot dip for use by farm visitors. Source dairy farmers were 4.4-times more likely to use a hired contractor to spread slurry than control farmers. The most commonly reported method of transporting cattle to and from SDFs was using livestock hauliers (76%) while control farmers were most likely to use their own trailer (80%). All SDFs and 98% of CFs reported operating a policy for rodent control on-farm. In total, 68% of SDFs and 65% of CFs reported purchasing animals in 2018. With regard to purchasing strategy, SDFs were 2.3- and 3.25-times more likely to buy animals from a closed herd or a herd using bulk tank milk (BTM) disease screening than CFs, respectively. Both SDFs and CFs who bought in cattle were equally likely to operate a quarantine policy for newly purchased animals upon arrival on-farm (79%). Of the farmers operating a quarantine policy, the majority (54%) of SDFs and CFs most commonly quarantined animals in a separate house from other cattle groups. Most frequently, SDFs (85%) and CFs (89%) who quarantined animals did so for a period of ≤ 4 weeks. The CFs were 1.4-times more likely to test newly purchased animals for disease than SDFs. Nose-to-nose contact with cattle on neighbouring farmers was possible on 13% of SDFs and 14% of CFs.

Conclusions: The results of this survey, the first to be administered to dairy farmers engaged in heifer contract rearing, indicate aspects of good bio-exclusionary practices on both farm enterprise types (use of foot-dips, rodent control, quarantining incoming livestock and limited neighbouring livestock nose-to-nose contact). However, many biosecurity risks were identified equally on both farm enterprise types (increased herd size, open herds, not testing purchased cattle and not buying them from closed or BTM testing farmers, short and non-exclusionary quarantining and using external livestock hauliers and slurry contractors). More of the farmers who send their heifers out to contract rearers (SFD) appear to be taking greater risks with some of these practices (open herd status and not testing purchased cattle and use of slurry contractors, and livestock hauliers). This is despite the potential increased risk for disease transmission associated with contract rearing for SDFs.

Keywords: Dairy, Heifers, Contract rearing, Bioexclusion.

Do attitudes and personality of calf care workers affect calf mortality?

Dagni-Alice Viidu[1], Eamonn Ferguson[2], Tanel Kaart[1], Kerli Mõtus[1].

[1]Estonian University of Life Sciences, Tartu, Estonia; [2]University of Nottingham, Nottingham, United Kingdom.

Objectives: Calf care workers are the main persons responsible for the daily care and health surveillance of pre-weaned calves. Due to their high contact rate with calves, their attitudes and personality might affect calf health and welfare. The aim of the current study was to analyse the associations between calf care workers' attitudes, personality traits, job satisfaction and calf mortality.

Materials and methods: Random sample of 120 herds was taken from a list of all Estonian dairy herds with at least 100 cows. Calf care workers who had worked in the farm for at least one year were asked to complete an anonymous questionnaire. The questionnaire registered respondent´s characteristics (age, gender, level of education and working experience) as well as their attitudes towards calves and calf mortality, farm working conditions and satisfaction with different job-related factors. The statements also revealed respondents´ overall empathy, self-confidence and importance of quality of life. Ten-item personality inventory form was used to register calf care workers' personality dimensions. A 7-point Likert scale was used to record the responses.

Based on the farm records and Estonian Agricultural Registers and Information Board data, a yearly calf mortality risk was calculated for each participating herd for calves up to

21 days and 22-90 days. Spearman correlation analysis was used to analyse the associations between calf mortality and statements from the questionnaires and variables with a p-value of < 0.25 were further used in K-mean clustering analysis to identify different calf care workers´ clusters based on their attitudes and personality.

Results: A total of 176 filled questionnaires from 108 different farms were received. The mean number of calves born in the study herds per year was 535. The mean calf mortality risk was 5.4% (range 0-23.3%) during the first 21 days of age and 2.7% (range 0-12.7%) during 22-90 days of age.

Seven of the studied statements were significantly associated with calf mortality risk in the younger (0-21 days) age group. Based on these statements, cluster analysis revealed four clusters. The average yearly calf mortality risk was 7.5% in cluster (CL) 1, 5.6% in CL2, 3.7% in CL3 and 4.0% in CL4. Calf mortality risk of CL1 differed significantly from that in CL3 and CL4 (p < 0.01). Calf care workers of the highest mortality cluster (CL1) were less satisfied with calf mortality level. They also felt that calf health problems are not under their control and they cannot overcome these on their own. In such herds, calf care workers also thought that higher calf mortality increases their workload. They were also less satisfied with their working equipment. A weak positive correlation between respondent´s extraversion and calf mortality was identified in the correlation analysis, but it appeared insignificant in cluster analysis.

In the older calf group (22-90 days), 11 statements met the criteria for including in the cluster analysis. The average yearly calf mortality risk was 3.4% in CL1 and 2.1% in CL2 with statistically significant difference between the clusters (p < 0.01). Similarly, a higher level of dissatisfaction with calf mortality level and working equipment was identified in the cluster with higher calf mortality (CL1). Calf care workers from the lower mortality cluster (CL2) agreed more that the people working with calves affect calf mortality.

Conclusions: This study revealed an association between calf care workers attitudes and mortality of calves, and possibly a two-way direction of the effect exists. In farms where calf mortality is high, calf care workers are more likely to feel that their skills and knowledge are insufficient to deal with calf health problems and they need more support from the veterinarians and other farm personnel to avoid frustration and possible decline in work motivation.

In addition to promoting the good health of calves, the working environment and equipment should be improved where.

Keywords: calf, mortality, calf care workers, personality.

In practice animal health management by a digital app and relevant biomarker monitoring methods for farmers and veterinarians

Lena Eggers[1], Marcel Brautzsch[2], Ulrich Meyer[3], Martin Höltershinken[4], Peter Zieger[5], Marion Schmicke[1].

[1]Agricultural University of Halle, Halle, Germany; [2]35mm.me UG Halle, Halle, Germany; [3]Friedrich - Löffler - Institut, Braunschweig, Germany; [4]Tierärztliche Hochschule Hannover, Hannover, Germany; [5]Quidee GmbH, Homberg, Germany.

Objectives: During the transition periode dairy cows are submitted to massive metabolic changes and challenges. There is therefore an increased risk for cows to fail, resulting e.g. in ketosis [1,2]. In time prognosis of cows at risk would allow sucessfull preventing measures [3,4]. In the predessing optiKuh2-Project a predictive model for estmating the ketotic risk has been developed (Risk- and DataIndex=RuDI). The aim of this study was to integrate this model into a digital APP in order to allow farmers and veterinarians to reliably estimate the transition cow risk of cows and to precisely monitor the

Parameter	Calcium 1		Calcium 2		NEFA		BHB		IGF-I	
Method	Cobas Mira	Vet-Photometer	Cobas Mira	Horiba LAQUAtwin	Cobas Mira	Vet-Photometer	Cobas Mira	BHB Sticks Keto	RIA	ELISA
Number n	19		8		20		20		20	
Minimum	1,87	1,85	1,55	1,50	50	100	0,34	0,5	39	29
Mean	2,15	2,20	2,20	2,21	301	345	0,83	1,18	132	185
Maximum	2,50	2,42	2,48	2,50	1550	1570	3,33	5,30	254	381
Standard Deviatioin	0,16	0,16	0,29	0,31	336	330	0,64	1,03	69	99
Correlation-coefficient (r)	0,734		0,979		0,997		0,994		0,974	
95% Confidence-intervall	0,419 – 0,891		0,884 – 0,996		0,993 – 0,999		0,984 – 0,998		0,934 – 0,990	
P	0,0003		<0,0001		<0,0001		<0,0001		<0,0001	

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disease incidences for a better health and cow welfare. For the validation of the APP several on site practice methods were established.

Material & Methods: On 2 dairy farms (105 cows/76 cows) transition cows were blood sampled from the tail vein. Ca, BHB, NEFA and IGF-1 was evaluated in laboratory by photometric methods (Cobas Mira/RIA) and the results compared to on site methods (Ca: Vetphotometer/Horiba iCa Laquatwin, Quidee GmbH; BHB - BHB-check-ß Keton (Taidoc); Nefa: Vetphotometer, Quidee GmbH).

Results: (Table).

Conclusions: The onsite tests Ca, Nefa and BHB worked very well with a significant correlation compared to the laboratory methods. Only for IGF-1 there is actually no on site test available. These results can be entered into an animal health APP to better identify and quantify the risk of ketotic cows, being then displayed on this APP. This allows a much more preventive management of cows at risk for a transition disease.

Keywords: animal health; biomarker; calcium test; Nefa; ketosis.

HH-P21

Application Note for the Use of a Wireless Device Measuring Reticuloruminal pH under Practice Conditions in a Swiss Dairy Herd

Eveline Studer, Maher Alsaaod, Adrian Steiner, Jens Becker.

Ruminant Clinic, Vetsuisse Faculty, University of Bern, Bern, Switzerland.

Objectives: Subacute ruminal acidosis (SARA) is caused by ingestion of diets high in rapidly fermentable carbohydrates and/or deficient in physically active fiber, often suspected in high yielding dairy cows. Although SARA has been defined as repeatedly occurring periods of low ruminal pH, both practical measuring methods and threshold values remain subject to research.

Smart farming represents application of new digital and high-tech technologies into farming. Reticuloruminal pH can be monitored continuously using indwelling boluses situated in the reticulum, linked to a wireless data transmission system.

The objectives of this study were i) to test one commercially available bolus type under field conditions and ii) to suggest a threshold value for SARA on herd level. Three aspects contributed to threshold proposition: testing strategies in published literature, continuity of measurement, and length of the possible insult due to low pH values.

Material and Methods: In a dairy herd of 58 Holstein Friesian cows in Switzerland, in 2021, one bolus (smaXtec animal care GmbH, Graz, Austria) per cow was administered orally to 15 cows in their first third of lactation. The average daily herd milk yield had dropped significantly, fever of unknown origin occurred in several cows, and liver abscesses were found in two cows at slaughter. After a diagnostic visit, SARA remained the most probable underlying cause. Boluses were used to

measure reticuloruminal pH in 10-min intervals during 150 days as guaranteed by the manufacturer. Mean individual circadian pH curves were calculated and summarized into a herd level circadian pH curve. A critical number of three or more cows with a ruminal pH ≤ 5.5, adapted from Garrett and Oetzel 1999, and a minimum of 3 hours duration, adapted from Ghozo 2005, were defined to be suspicious for SARA.

Results: The application of the boluses was uneventful. Twelve out of 15 indwelling boluses (80%) provided reliable data. Data from three boluses had to be excluded due to their random unintentional malposition in the rumen instead of reticulum or failure of accurate pH measurement. Of all measurements, 0.032% were pH values ≤ 5.5 (range: 4.67 - 5.5). No event of three cows simultaneously showing a ruminal pH ≤ 5.5 during a ≥ 3 hours interval was recorded throughout the study period. Maximum time interval where pH was ≤ 5.5 in a single cow was 2 hours.

Conclusion: The bolus enables the demonstration of circadian pH changes in individual cows, and can be used for practical purposes, although both malposition in the rumen and failure of accurate pH measurement occur. On herd level, automatic calculation of mean herd values is not provided by default, and we propose establishment of such a data tool.

Our proposed threshold of three cows out of 12 with a ruminal pH ≤ 5.5 during ≥ 3 hours was applicable regarding data processing. The herd level dataset of mean pH values never met the criteria despite being collected in a population at risk. A critical view on validity of our threshold suggestion is therefore needed, involving a larger study population. Additional considerations need to include the possibility that our herd was truly positive for SARA, but we failed to proof. Although thresholds on herd level are the scope of herd health medicine and smart farming innovations nowadays, individual susceptibility on cow level might be an interesting field of research, considering that data on herd level may not represent the true sum of individual pathophysiological processes.

We therefore conclude that continuous monitoring of reticuloruminal pH is possible and applicable for herd level investigations, but both reliability of the elected threshold and data procession may need improvement.

Keywords: Dairy Herd Health Management, Subacute Ruminal Acidosis, Smart Farming, Reticuloruminal pH.

HH-P22

Immunoglobulin concentration and bacterial contamination of bovine colostrum samples

Nicole Hechenberger[1], Ariane Psenner[2], Maren Marseiler[2], Thomas Wittek[2], Katharina Lichtmannsperger[2].

[1]Austrian Animal Health Service, Salzburg, Austria; [2]University Clinic for Ruminants, University of Veterinary Medicine Vienna, Vienna, Austria.

Objectives: Feeding poor quality colostrum is one of the most important risk factors for calves facing failure of passive transfer of immunity (FPT). Good quality colostrum is defined

as an immunoglobulin concentration of >22.0% Brix and a low bacterial contamination (total plate count <100,000 colony forming units/ml; fecal coliforms <10,000 colony forming units/ml). The objectives of this study were to 1) assess immunoglobulin concentration and 2) bacterial contamination of colostrum samples originating from cows from the federal district of Salzburg, Austria.

Material and Methods: From November 2020 to January 2022, members of the Animal Health Service of the federal district of Salzburg were ask to participate in the study. The study participants answered a questionnaire regarding general farm characteristics and specific questions on colostrum management. Colostrum samples were taken from primiparous and multiparous cows and stored at the farm of origin at minus 20°C until they were transferred to the University Clinic for Ruminants for further analysis. Immunoglobulin concentration was assessed by using a digital Brix refractometer. Bacterial contamination was assessed by plating the samples on Columbia agar (containing 5% sheep blood) and McConkey agar for total plate counts and fecal coliform counts, respectively. The agar plates were incubated for 18 to 24 hours at 37°C. The colonies were counted using Fiji-Software. Colostrum samples were categorized in good and poor-quality colostrum using the aforementioned thresholds for Brix values and bacterial contamination.

Results: In total, 72 farms participated in the study. The farms were distributed within the federal district of Salzburg in the regions of Flachgau (n=28), Pongau (19), Pinzgau (14), Lungau (7) and Tennengau (4). The majority of farms were dairy farms (69 farms; 95.8%), one farms was a cow-calf operation (1.4%) and two farms were mixed farms (2.8%). Forty-seven farms (65.3%) produced according to the European standards for organic farming and 25 farms (34.7%) run a conventional farm. Forty-one farms (56.9%) were full-time and 31 (43.1%) were part-time farms, respectively. The number of calvings per farm were as follows: ≤20 calvings = 29 farms (40.3%) and >20 calvings = 43 farms (59.7%). The cows were between their 1st and 14th lactation. In total, 278 (26.5%) primiparous and 752 multiparous cows were included. Dry period length was <6 weeks in 34 multiparous cows (4.6%) and ≥ 6 weeks in 707 cows (95.4%).

In total, 1.051 colostrum samples were collected. The samples originated from 34 farms breeding Simmental cows (n = 605 colostrum samples), 32 farms kept multiple cattle-breeds (381), three farms bred Pinzgauer cows (35) and two farms bred Holstein cows (23). Immunoglobulin concentrations ranged from 7.3% to 36.1% Brix (median = 22.0%; mean = 21.8%). Brix values of ≤22% were found in 529 (50.3%) and >22% in 522 (49.7%) of the analyzed samples, respectively. Brix values of <18% were found in 198 (18.8%) of the analyzed colostrum samples. Total plate counts were examined in 528 colostrum samples, whereof 326 (61.7%) met the standards for good quality colostrum yielding <100,000 cfu/ml and 202 (38.3%) showed total plate counts of ≥100,000 cfu/ml. Fecal coliform counts were investigated in 611 colostrum samples. In total, 550 colostrum samples (90.0%) were within the threshold for good quality colostrum yielding <10,000 cfu/ml and 61 colostrum samples (10.0%) were ≥10,000 cfu/ml.

Conclusion: In terms of immunoglobulin concentration and bacterial contamination, the results show that colostrum quality needs to be improved on the investigated farms.

Q fever vaccination strategy

Didier Raboisson[1], Raphael Guatteo[2], Brigitte Trezzani[3], Philippe Gisbert[4], Ahmed Ferchiou[1].

[1]National Veterinary School Toulouse (ENVT), Toulouse, France; [2]Veterinary college of Nantes (Oniris), Nantes, France; [3]CEVA Animal Health, Lyon, France; [4]CEVA Animal Health, Libourne, France.

Objectives: Q-fever is a common disease in dairy cow worldwide. It is due to *Coxiella burnetii* infection and is associated with abortion, higher risk for placental retention, metritis and deteriorated reproduction performances (delayed conception, longer calving calving intervals and extra artificial insemination). Average within-herd and inter-herd prevalence of Q-fever in dairy production is estimated to 40% and 20%, respectively.

Vaccination is a common tool for Q-fever control. Most of time, it is used when the presence of Q-fever within a herd is detected, so as to limit its spread within herd and to reduce clinical consequences. The present trial aims at defining the economic benefit of Q-fever vaccination in the situations with moderate and high level of within-herd infection.

Materials and methods: A bioeconomic static model has been developed to mimic 3-year herd dynamics after vaccination. The benefit of the vaccination is assessed through a partial budget analysis based on the difference of the situation with vaccination compared to without vaccination. The production losses before vaccination were equal to the total cost when no vaccination for one year, and was constant during a given analysis, years after years, assuming no change in the situation if no vaccination was done. The production losses after vaccination were the final impact of Q-fever, when vaccination is done (damage is only partly decreased) for the 3 years after vaccination started. It is considered that vaccination improves health and reproductive performances differently for cows and heifers. The vaccine costs were changing every year since two injections are needed the first year for all the animals and the following years for heifers only. The cows already vaccinated the previous year received only one injection. Two level of Q-fever infection intensity was modelled.

Results: Vaccination protection makes it possible to reduce almost completely the number of cows infected in the dairy herd after 3 years. Vaccination is cost effective starting year 2 after vaccination. For a 100 cows herd with a low prevalence of Q fever infection (20%) before vaccination, the 3-year benefit is estimated at 3,169 €. For a herd with a higher prevalence (40%) of infected cows before vaccination, the benefit reaches 11,937 €.

Conclusions: The model allows to mimic the changes in within-herd infection level when vaccination is done. The benefit of vaccination for the 3 years ranges from 3,000 € to al-

most 12,000 € depending on the initial infection prevalence in the 100 cows herd. Our model focuses on cost benefits directly linked to animals and thus don't take into account farmer labour cost, improvement of productivity due to a better welfare and a lower quantity of milk discarded for sanitary concerns. Public health costs are also not included in this study although Q fever is a zoonosis. In spite the method only provides simplified consideration of disease dynamics and complexity, it appears as sufficient considering data available in the literature for its calibration, and it permits to demonstrate the benefit of vaccination against Q-fever.

Keywords: Q fever, vaccination, bioeconomic model, economics.

HH-P24

Systematic approach to neonatal diarrhea in dairy farms

Carolina Tejero[1], Clara Succarrats[2], Elisenda Vidal[2], Alba Sala[3], Luz Sales[3], Tatiana Fabra[3], Pablo Real[3], Santiago Navarro[4], Miguel Fernandez[4], Laura Elvira[1].

[1]*MSD Animal Health, Salamanca, Spain;* [2]*Veterinary Practitioner, Lleida, Spain;* [3]*Veterinary Practitioner, Huesca, Spain;* [4]*Veterinary Practitioner, Valencia, Spain.*

Objectives: Neonatal calf diarrhea (NCD) is a major health and welfare challenge during the first month of life. It is associated with reduced weight gain, increased mortality, and morbidity rate. Moreover, it is a frequent cause of antimicrobial use in dairy farms. NCD is a multifactorial disease and clinical cases are triggered by the interrelation of several factors.

On large dairy farms, infectious pressure is a key aspect due to the high number of calving's and calves per unit of time. Therefore, the aim of this cross-sectional study was to evaluate the different environmental and management factors associated with an increased infectious pressure. A secondary objective was to develop a practical tool to monitor these risk factors in a structured way at farm level.

Material and Methods: Between 2019 and 2021, 6 dairy farms located in the Northeast of Spain with NCD problems (>20% morbidity) were analyzed at herd level to identify potential sources of exposure to NCD pathogens. Additionally, epidemiologic data such as sanitary program, passive transfer, age of onset of NCD, morbidity, and mortality were monitored. Moreover, to identify the etiology of NCD, fecal samples were collected from clinical NCD calves and sent to the laboratory.

To identify those potential sources of exposure to enteric pathogens and based on calves traffic patterns four points were sampled to determine total aerobic bacteria, coliform count (CFU/cm³ or ml) and *Salmonella spp.* presence: calving area bedding, colostrum, calf housing bedding and calf feeding equipment.

Results: NCD morbidity and mortality ranged in the different farms 40-70% and 1.9-6.2, respectively. Although most farms (5/6) vaccinate the dams against NCD, in most of them (5/6) a high percentage of calves showed failure of passive transfer (FPT) (n=4308, range 1-29%). On the other hand, re-

lated with the NCD etiology, 68 fecal samples were collected: 32% of samples were positive to one pathogen (being *E. coli* the most prevalent isolated pathogen), while 59% were positive to 2 or more pathogens (being the combination *E. coli* with *Cryptosporidium spp.* the most frequent). Moreover, in 3 farms, *Salmonella spp.* was isolated.

The environmental bacteriological sampling showed:

- Calving area: all farms had group calving pens with straw (2) or compost (4) bedding. The TCC in the 18 samples analyzed in occupied pens was above the goal of TCC < 5x10⁵ CFU/cm³ suggested by McGuirk (2008) in a 45% (23% and 85% for compost and straw bedding, respectively). Interestingly, on the 3 farms with fecal samples positive to Salmonella in the calves, were already positive in the calving bedding.

- Colostrum: Colostrum on farms was used fresh (3) or heat treated (1) or both (2), finding as expected, a lower bacterial contamination in the pasteurized colostrum.

- Calf housing: In all farms, calves were housed in individual hutches for the first weeks of life, with different types of bedding by farm and/or season (straw, sawdust, or sand). The highest bacterial contamination was obtained in sand (n=5), with 60% of samples above recommended goal and 1.4x10⁷ UFC/cm3 on average; while the same farm using straw bedding in winter (n=4), 60% were adequate and average TCC was on average below the limit 2.4x 10⁴ CFU/cm³.

- Calf feeding material: the samples collected from the feeding equipment at the end of milk feeding. There farms used different feeding systems being 100% of bottle with teats below the limit, while 100% were above the limit in the bucket with nipple and 43% above the limit in buckets). On the other hand, comparing the cleaning system (50% of samples were above the limit with manual cleaning while a 100% were below with the dishwasher).

Conclusions: Farms with the highest mortality rate in the first month of life also presented the highest FPT rate. This showed how colostrum management is still a must and a major risk factor for NCD on large dairy farms, that clearly reduce the positive impact of dam's vaccination. Related to the sources of exposure to enteric pathogens from the environment: bedding type, colostrum management and feeding material hygiene can be interesting points to control on farms with endemic NCD, in order to reduce its economic impact and improve the welfare and antibiotic use in the calves.

Keywords: Neonatal, diarrhea, colostrum, management.

HH-P25

Colostrum supply: how is it done and what to improve?

Lisa Robbers[1], Hannes Bijkerk[1], Ad Koets[2], Lindert Benedictus[1], Mirjam Nielen[1], Ruurd Jorritsma[1].

[1]*Population Health Sciences, Utrecht University, Utrecht, Netherlands;*
[2]*Wageningen Bioveterinary Research, Lelystad, Netherlands.*

Objective: It is well known that colostrum feeding is essential for the transfer of passive immunity and health of newborn calves. The general advised strategy is to provide colostrum with some alliterating key aspects in mind: Quantity, Quickly, Quality and cleanliness. The aim of the survey was to substantiate how Dutch farmers translate the use of this advice into practice.

Materials and Methods: We randomly selected 400 dairy farmers with a conventional milking parlour and 400 dairy farmers with AMS from a national database of milk equipment services organizations. The farmers were approached by email and asked to participate in an online questionnaire. After some questions about farm management, we asked the farmers about the supply of colostrum to the most recently born calf. Among others, we asked when the newborn calf was fed for the first time, how farmers stored the colostrum in between feedings, and how they heated the colostrum before providing it to the calf.

Results: A total of 62 farmers with AMS and 45 farmers with a conventional milking parlour completed the questionnaire, resulting in an overall survey response of 107 farmers and a response rate of 13.4%. Milk production levels of these herds were around the national Dutch average, indicating representativeness of the respondents. The majority of the farmers (82%) reported that they used the dams' own colostrum for the first feeding of the calves, while some of them allowed the calf to suckle (14%) their mother. From 84 responding farmers, the amount of colostrum at first feeding was known and was on average 7.2 liters (SD 2.2). Out of these 84 farmers, 66 (79%) fed at least 6 liters of colostrum. Calves born during the afternoon received significantly more colostrum at first feeding than calves born during the evening and calves born at night had a significant higher risk to receive first colostrum later compared to calves born in the morning. On most occasions, colostrum feedings consisted of fresh colostrum given to the calf directly after milking. When colostrum was stored before feeding, the refrigerator was most often used, followed by storage at room temperature. Nursing bottles were most frequently used to supply colostrum.

Farmers indicated that they did not differentiate colostrum feeding strategies based on sex of the calves, which was in agreement with other analysis results from this study. We also found no differences in colostrum management between AMS farms and farms with conventional milking systems for any of the dependent variables.

Conclusion: We concluded that there are no systematic differences in colostrum management between dairy farms using AMS or a conventional milking system and that heifer and bull calves are treated similar with respect to colostrum management. Moreover, we found that the majority of farmers follow the general guidelines on colostrum management. More attention could be given to the timely feeding of colostrum of calves born in the night and to the storage conditions of collected colostrum.

Keywords: colostrum supply, online survey, current status, perspectives.

HH-P26

Milk and conductivity deviation settings on an automatic data collection system for accurate detection of acute disease in Holstein dairy cows

Aurora Villarroel.

Athyr Vet, LLC, Philomath, OR, United States.

Objective: The objective of this study was to determine whether a specific algorithm of milk and conductivity deviations on automatically collected data could be used to accurately identify diseased animals on several dairy farms as determined by professional veterinary examination as opposed to lay on-farm personnel examination.

Materials and Methods: A longitudinal observational study was undertaken at 3 dairy farms in Chile. Milk production and conductivity were automatically measured every milking for every cow. Deviations from the previous 10-day average for each specific metric are reported by the automated system for each cow after each milking. Based on previous work, the algorithm for mastitis detection was set as either (1) a single milking with -30% milk and +30% conductivity deviation, or (2) two consecutive milkings with +25% in conductivity in each. The algorithm for all other acute disorders was set as two consecutive milkings with at least -30% milk deviation if ≤200 DIM or at least -40% milk deviation if >200 DIM.

A veterinarian visited the farms 1-3 times per week and evaluated the cows on the list. Cows identified by on-farm personnel as diseased that were not flagged by the system were to be presented to the veterinarian at next visit. Data for this study included only veterinary evaluations. Positive and negative predictive values for the detection algorithms were calculated.

Results: The systems evaluated approx. 66,800 cow-days during the days that a veterinarian visited the farms. A total of 492 cows were flagged by the system (incidence = 7.3 per 1000 cow-days). A single cow (N=1) was deemed to have pathological findings by the veterinarian but not identified by the system, resulting in a negative predictive value of 99.9% (1/66,800).

Of the 492 cows flagged, 163 underwent veterinary examination. The rest were either diagnosed by on-farm personnel or missed by the sorting system and evaluated the following milking. A diagnosis was established by the veterinarian in 78 (47.9%) of the cows. In-depth evaluation of the 85 (52.1%) cows with no veterinary diagnosis revealed 27% (23/85) milked in a malfunctioning stalls. Of the remaining 62 cows with no pathologic findings on veterinary examination: 51.6% (32/62) had abnormal TPR (temperature, pulse, respiration), and 12.9% (8/62) had incomplete TPR values. Of the

remaining 22 cows (no pathological findings and normal TPR), 2 were in estrus and retained milk, 2 has incomplete milkout (increased milk in next milking), and 3 had received multiple vaccines in the previous 48 hours. A total of 7 cows with no documented diagnosis or management intervention had delayed milk production recovery that extended on average 38.4 ±50.0 days (range 6-140), while the remining 8 cows never recovered and were either culled or dried off.

After detailed review, evidence of abnormal health status (including long-term milk reduction) was *N*=125, resulting in a positive predictive value of 76.7% (125/163).

Conclusion: Previous studies used diagnosis by on-farm personnel as the gold standard for comparison to automatic data-collection systems, and have typically shown low accuracy for disease detection by the technology. We expected higher accuracy when trained veterinarians did the physical examination compared to lay on-farm personnel. Our results show that this is not the case.

The most likely reason for the discrepancy is due to the automatic systems functioning as diagnostic tests in series, multiple times per day, every day, while a veterinarian visiting the farm on occasional days functions as a single isolated diagnostic test. Additionally, the use of very granular data collected 2-3 times per day allows technology to identify cows with subclinical disease or detrimental management events that resulted in temporary decreased milk production.

A major conclusion is that our diagnostic techniques as veterinary practitioners need to evolve with the capabilities of the new modern automatic data-collection systems that exist on many farms to detect small consistent changes in individual cows. Additionally, a standard setting for all farms may not be appropriate, and therefore systems that can be customized to each farm may have a practical diagnostic advantage in the field. Using the data provided by these systems will help clinicians and consultants to identify management practices leading to sustained milk production losses in dairy cows, and thus help improve animal wellbeing.

Keywords: Automatic data, disease detection, algorithm, dairy, diagnosis.

HH-P27

Restriction of free access to feed and resting area after last milking before dry-off associated with lower blood calcium levels in dairy cows

Andrew Biggs[1], Peter Keyte[2], Maria Pimenta[3], António Silvestre[4], Ângela Martins[4], Juan Munoz Bielsa[5], Carla Azevedo[5].

[1]The Vale Veterinary Group, Devon, United Kingdom; [2]Ceva Animal Health, London, United Kingdom; [3]CITAB - Centre for the Research and Technology of Agro-Environmental and Biological Sciences, Vila Real, Portugal; [4]Trás-os-Montes and Alto Douro University, Vila Real, Portugal; [5]Ceva Santé Animale, LIBOURNE, France.

Objectives: A recent publication has emphasized the fact that subclinical hypocalcaemia can be found in dairy cows immediately following dry-off (Krogh et al., 2018) and

the condition of atypical milk fever (clinical hypocalcaemia in late gestation) has been described before (Radostits, 2007). Despite considerable research into dry cow management and the increasing level of milk production at dry-off in the modern cow, there is limited information available on the prevalence of hypocalcaemia at dry-off and potential associated risk factors. This study aims to assess the prevalence of subclinical hypocalcaemia after the last milking before dry-off in dairy cows in United Kingdom and the effects of restricting access to feed and lying area on the mean serum total calcium value at this stage of the lactation cycle.

Materials and methods: A total of 15 farms selected across South West UK participated in the study. Within these farms, 197 cows were included in the study follow-up between the 22th of November, 2018 and the 28th of February, 2019. For all cows, information was recorded regarding the time without free access to feed and lying area after last milking. Blood samples were collected 8-12h after their last milking before dry-off and sent to a reference laboratory. Subclinical hypocalcaemia was considered when cow blood calcium was <2.200 mmol/L. Statistical analysis was performed using the computer software JMP (version 7) SAS Institute.

Results: Overall 67% (132/197) of cows were without access to feed or lying for ≥ 1 hour after their last milking before dry-off. Analysis of serum total calcium demonstrated that 2% of cows had hypocalcaemia (5/197) 8-12 hours after their last milking before dry-off. Statistical analysis demonstrated that cows with ≥ 1h without access to feed and lying area had a significantly lower mean serum calcium value (mmol/L) 8-12 hours after their last milking before dry-off compared to those that were without access to feed and lying area for < 1hr (2.400 vs. 2.441, P=0.018).

Conclusions: This study demonstrates that subclinical hypocalcaemia in dairy cows after dry-off occurs in United Kingdom, and that restriction of access to feed and lying area increases the likelihood of lower blood calcium level of cows in the hours after dry-off.

Keywords: Dry-off, Calcium, Welfare, Dairy, Cows.

HH-P28

Dry-off practices on UK commercial dairy farms

Andrew Biggs[1], Peter Keyte[2], Maria Pimenta[3], António Silvestre[4], Ângela Martins[4], Juan Munoz Bielsa[5], Carla Azevedo[5].

[1]The vale Veterinary Group, Devon, United Kingdom; [2]Ceva Animal Health, London, United Kingdom; [3]CITAB - Centre for the Research and Technology of Agro-Environmental and Biological Sciences, Vila Real, Portugal; [4]Trás-os-Montes and Alto Douro University, Vila Real, Portugal; [5]Ceva Santé Animale, LIBOURNE, France.

Objectives: Dry-off is an extremely important, but also risky period for the dairy cow. Traditionally, dry period management has been focused on practices that are aimed at maximizing milk production in the subsequent lactation while optimizing the health and fertility of lactating cows. However, current dry-off methods present drawbacks. Abrupt dry-off has

a higher risk of new intramammary infections and excessive engorgement of the udder, and gradual dry-off stresses animals through feed restriction and social regrouping. In both cases there is a negative impact on dry cow health and welfare. A better knowledge and understanding of current dry-off practices would help practitioners to implement best practices and identify future research priorities. The study was aimed at investigating the prevalence of different dry-off practices, with a special focus on those procedures that can potentially adversely affect cow health and welfare.

Materials and methods: A total of 15 farms selected across South West UK participated in the study, with the size of herds ranging from 130 to 800 dairy cows. Information on production parameters, feeding and management practices at dry-off, both at herd and cow level, were collected through a farm audit and survey from participating farms between November 2018 and February 2019.

Results: The farms had a mean production (energy corrected milk) per lactation of 9,983.5 ± 1,310.6 kg milk. The majority of cows in participating dairy farms (70.8%) were dried-off at 10-30 kg/d of milk production (10-20 kg/d: 34.6 %; 20-30 Kg/d: 36.2 %). Cows dried-off with a daily milk production >30kg represented 9.4%. Just over half the herds (53.3%, 8/15), performed abrupt drying-off, while 46.7% (7/15) of the farms performed a gradual drying-off. Among the herds performing a gradual dry-off, 71.4% (5/7) reduced both milking frequency and feeding regime prior to drying-off, while 28.6% (2/7) only modified the feeding regime before drying-off. No herds reduced solely milking frequency. Changes in the feeding regime concerned changes of only feed quantity (n=4), only feed quality (n=2) or both (n=1). Following last milking, 26.7% (4/15) and 53.3% (8/15) of farms did not allow cows free access to water or to feed and resting area for ≥ 1 hour, respectively. In 100% (15/15) of farms, cows after their last milking after dry-off were moved to a dry cow shed and isolated from the lactating cows.

Conclusions: Potentially stressful procedures for cows such as abrupt cessation of milking in high yielding cows, changes to their diet, social regrouping and restricted access to water, feed or resting area at dry-off are part of dry-off management procedures on dairy farms. These results evidence the need to find a simpler method for abruptly reducing milk production without negatively impacting udder health and cow welfare.

Keywords: Dry-off, Dairy, Welfare, UK.

Objective: To evaluate the effect of addition of sodium bicarbonate and fodder in the diet, plus the increase of feeding space on the daily weight gain and food conversion at 30 and 50 days.

Material and methods: This study was carried out in a cattle fattening facility located in the state of Michoacán, México. Two groups were formed, Treated Group A, integrated by 225 animals Bos taurus x Bos indicus, with a weight range between 226-330 kg, conforming 5 pens, 45 animal in each pen. In the first 7 days a diet with 22% of pellets and 78% of fodder was offered; from day 7 to day 14 it was a diet with 40% of pellets and 60% of fodder; from day 14 to 21, they enter in a transition period, the first meal of the day is 40% pellets and the second 70% of pellets and the rest fodder until it's completion. During the first 7 days corn stubble was added as fodder to stimulate animal consumption; additionally, sodium bicarbonate was administered in the drinking water in a dose of 180 gr/animal for 4 days, to contribute to the increase in consumption of dry material and a better digestion. The B Group (control) was formed by 326 animals Bos taurus x Bos indicus, with a weight range from 226-330 kg, separated in 5 pens of 65 animals each, they received the same diets as the treated group, except for forage stimulation and the addition of sodium bicarbonate in the drinking water. Both groups underwent a preventive medicine program consisting of deworming against gastrointestinal and pulmonary worms, vaccination against clostridiums and bovine respiratory complex, as well as the use of hormonal implants and the use of antibiotic – based metaphylaxis such as Tulatromycin and Enrofloxacin.

Results: The Treated Group A had an initial weight of 286.8 kg and the Control Group B of 288.7 kg. The daily weight gain (DWG) at 30 days of the Treated Group A was 1.31 kg compared to the Control Group B with a DWG of 1.09 kg (P<0.05). The DWG at 50 days (reimplantation weight) of the Treated Group A was 1.38 kg and the Control Group B of 1.1 kg, there being a significant difference (P<0.05). The feed conversion (FC) at 30 days of Treated Group A was 6.31 kg, while in Control Group B it was of 6.26 kg (P>0.05), while the FC at 50 days (reimplantation weight) for the Treated Group A was 5.83 kg and for the Control Group B, 6.03 kg, there was no significant difference (P>0.05). CONCLUSIONS: For the Treated Group A, with the addition of fodder and sodium bicarbonate, plus the increase in feeding space, the behavior of the DWG was better than in the Control B Group, there being a significant statistical difference, but not with the FC between the group.

Keywords: Fodder, feeding space, sodium bicarbonate.

HH-P30

Evaluation of productive parameters associated with food manegement and well - being in beef cattle

Diana García Calvo[1], Eduardo Posadas Manzano[1], Silvia Denise Peña Betancourt[2], Pedro Ochoa Galván[1].

[1]Facultad de Medicina Veterinaria y Zootecnia, campus Ciudad Universitaria de la Universidad Nacional Autónoma de México, Ciudad de México, Mexico; [2]División de Ciencias Biológicas y de la Salud. Universidad Autónoma Metropolitana. Campus Xochimilco, Ciudad de México, Mexico.