ICAR TECHNICAL WORKSHOP
10-12 JUNE, 2015
KRAKOW, POLAND

PROGRAMME

PERFORMANCE RECORDING IN THE GENOTYPED WORLD

ICAR 2015
TECHNICAL WORKSHOP

SESSION 1: WHAT ELSE CAN WE LEARN FROM MILK SAMPLE?

GLOBAL EXPERIENCE ON KETOSIS SCREENING BY FTIR TECHNOLOGY

Schedule: Wednesday 10:30 AM

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The purpose of this study is to summarise the latest global experience on the application of a fairly new service that dairy herd improvement organisations can offer their customers – ketosis screening.

Ketosis is a metabolic disorder which usually occurs in dairy cattle during the early lactation period when energy demands for milk production exceed energy intake. This negative energy balance results in the cow using her body fat as an energy source, leading to an excessive accumulation of ketone bodies (i.e. acetone (Ac), β-hydroxybutyrate (BHB)) in blood as the fat is broken down faster than the liver can process it.

The Fourier transform infrared (FTIR) spectrometry method developed for measuring ketone bodies in milk indicated adequate correlations with chemical method results and was proven to be valuable for screening cows for ketosis. In Quebec, Canada, Valacta has started offering the Ketolab ketosis screening service based on the measurement of BHB as an option to farmers since April 2011. Over 54% of cows are now screened for ketosis with the service. In 2011, prevalence of ketosis was 26% and has been declining steadily to 15% in 2014. Compared with negative (BHB < 0.15 mM), cows with elevated (>0.20 mM) BHB produced 2.4 kg less milk on test day, had higher fat and somatic cell count (SCC) and lower protein and urea content in milk. Reproductive performance was also severely affected by ketosis: cows with elevated BHB in early lactation had 24 more days open than negative cows and were 20% less likely to calve again.

In France a Ac and BHBA FOSS calibration consolidated in a bio-model called CETODETECT® is used to predict the risk of ketosis based on the analysis of regular milk recording samples. The scale ranges from 0 to 5, where 0 = healthy animals; 1 and 2 = subclinical ketosis; 3 to 5 = clinical ketosis. Overall, the prevalence of ketosis varied between 10 and 30% according to the season and thus the feeding. Lower values were associated with high quality of grass for grazing during the spring months, whereas the prevalence increased when low quality silage was fed over the winter. Evidently higher values for milk yield and fertility parameters but lowest for SCC values were observed in cows with a score of 0 compared to those with a score of 5. The ketosis testing service is offered for 3 eper cow and year and utilised by approximately 50% of all farmers.

In the Netherlands and Flanders, Belgium, ketone bodies are routinely measured with milk recording analysis. FTIR predictions for Ac and BHBA are combined with a few cow-related parameters into a binary (yes/no) score for ketosis. Ketosis scores for cows in the first 60 days of lactation are provided to dairy farmers through the milk recording report and are also used by the feed companies for evaluation of the transition period and the ration. The prevalence of ketosis in the Netherlands is 12%. Ketosis is a moderate heritable trait (heritability of 20%). Breeding values for ketosis are published since December 2014 and are part of the CRV breeding index "Better Life Health". This new service to provide routinely ketosis scores for fresh cows is well valued by the dairy farmers and feed companies.

In conclusion, screening for ketosis using milk Ac and BHB levels clearly indicates metabolic challenges in early lactation that have profound negative effects on subsequent performance. The service is profitable with a return of investment of about 10 to 1 and has also an added value in terms of breeding purposes. Ketosis screening offers high value to milk recording clients and elevates awareness of an otherwise undetected problem. This in turn can help reduce the incidence of the problem.

NEW MILK MID-FTIR METRICS FOR DAIRY CATTLE MANAGEMENT

DAVID BARBANO

Schedule: Wednesday 10:45 AM

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The key FA parameter that was positively correlated with bulk tank milk fat and true protein concentration was DeNovo FA (g/100 g milk). Structural parameters of FA chain length (carbon number) and total unsaturation (double bonds /FA) were negatively correlated with fat and protein (g/100 g milk). This was true for both Jersey and Holstein. When DeNovo FA (relative% of FA) were higher, fat test was higher for both Jersey and Holstein. As DeNovo FA (g/100 g milk) increased, fat (g/100 g milk) increased ($P < 0.001$) at a much faster rate (i.e., higher slope) than when preformed FA (g/100 g milk) increased (slope 2.28 vs. 1.29) for Jersey and for Holstein (slope 2.16 vs. 1.22), for DeNovo vs. preformed, respectively. As the proportion of DeNovo FA increased (and fat percent increased), the measured FA chain length and double bonds per FA decreased ($P < 0.001$). True protein (g/100 g milk) increased as DeNovo FA (g/100 g milk) increased. What we do not know from this work is if the production of milk components per cow per day are higher when DeNovo FA as a proportion of total FA is higher. This will be critical in determining if feeding and management strategies to increase DeNovo FA production per day will also increase output of fat and true protein per cow per day. That will be the focus of a follow-up farm management field study.

PREDICTION OF THE RISK OF KETOSIS USING MID INFRARED SPECTROMETRY

MARINE GELÉ; MARION FERRAND[1]

Schedule: Wednesday 11:00 AM

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Mid infrared spectrometry is used in every milk analysis laboratory to estimate fat and protein contents. This method is based on the absorption of infrared radiation by the molecules present in milk at different wavelengths. MIR spectra can be used to estimate fine milk components such as fatty acids, protein, minerals. The European program OptiMIR aims to use MIR spectra to predict physiological status of the cows, such as ketosis. Ketosis is a metabolic disease due to a deviation of energy metabolism of high production level cows in a situation of severe negative energy balance. A data collection took place in four experimental farms in France and Germany on 214 Holstein, Montbeliarde and Abundance cows in early lactation. Blood samples were collected once a week for each cow during the seven first weeks of lactation to measure beta hydroxybutyrate and non-esterified fatty acids contents which are respectively predictors of ketosis and fat mobilization. Those predictors were used to classify the cows between "healthy" and "ketotic" cows. The "ketotic" cows were then classified into three status: "high ketone bodies content", "high fat mobilization" and "ketosis". An 80% sensitive and specific prediction equation of the "healthy" versus "ketotic" status was developed by logistic Partial Least Square regression. Then a prediction equation of the type of risk were developed for "ketotic" predicted cows with a well classified rate of 85%. Thanks to those models an alert can be given to the farmer concerning cows to monitor and cows to treat.

NOVEL MODEL OF MONITORING OF SUBCLINICAL KETOSIS IN DAIRY HERDS IN POLAND BASED ON MONTHLY MILK RECORDING AND ESTIMATION OF KETONE BODIES IN MILK BY FTIR SPECTROSCOPY

ZYGMUNT KOWALSKI; ARTUR PŁYTA; ELZBIETA RYBICKA[1]; WOJCIECH JAGUSIAK[2]; KRZYSZTOF SŁONIEWSKI[1]

Schedule: Wednesday 11:15 AM

University of Agriculture in Krakow, Department of Animal Nutrition and Dietetics; Al. Mickiewicza 24/28; 30-059 Krakow; Poland
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The aim of a lecture is to present the new system of monitoring of subclinical ketosis (SCK) in Poland, based on monthly milk recording. The preliminary results of such monitoring will also be presented as well as the main risk factors for SCK in Poland. To our best knowledge, the system presented here is the only one all over the world, by which the whole recorded population of cows is being systematically monitored for SCK. SCK is an excess of circulating ketone bodies in the blood without clinical signs of ketosis, such as decreased appetite and weight loss. The lack of clinical signs makes SCK difficult to detect. However, using blood β-hydroxybutyrate (BHBA) testing to measure the incidence or prevalence of SCK in a herd is a powerful and useful tool. In Poland we use milk content of BHBA (M-BHBA) and acetone (M-Ace) to detect cows and herds in risk of SCK. M-BHBA and M-Ace are determined by MilkoScans with FTIR, placed in four labs of Polish Federation of Cattle Breeders and Dairy Farmers. The system (Kowalski and Słoniewski, 2013) was introduced into the practice in April 1, 2013 and about 720 000 cows are being monitored annually. The cows between 6 and 60 days in milk (DIM) are not diagnosed but identified as "in risk". These cows are pointed as "K!" A special statistical method was implemented to calculate the probable frequency of SCK (so called PFSK). If it is higher than 10 or 20%, the herd is recognized as "in risk" or "in high risk", respectively. The results of such a monitoring are presented to the farmers in monthly reports delivered by the internet. A preliminary survey (after 12 months) of the results shows that 11,5% of cows at 6-60 DIM are in a risk of SCK. Surprisingly, more ketotic cows have been found in lower productive herds than in higher productive ones. So, high milk yield is not a risk factor for SCK in Poland. Other factors will be shown and discussed during the lecture. Moreover, future activities of the group will be presented.

EXPERIENCE OF MILK BASED FARM MONITORING OF LPT LTD.

LÁSZLÓ DÉGEN; MÁRK MATEJCSIK

Schedule: Wednesday 11:30 AM

LPT Ltd, Dózsa Gy út 58, 2100 Gödöllo, Hungary

One page summary report was developed by LPT Ltd. The report not only provides easy to use information about the urea content of the milk samples, but also informs about subclinical acidosis. It is easy to point out if any changes occur in protein or energy supply by lactation numbers and stages. High urea level has negative effect on reproduction due to excess of protein (degradable, soluble protein).

The high milk urea (higher than 32 mg/dl) or the increasing value (higher than 4 mg/dl) is caused by the key factors besides others as follows:

- Feeding too much total crude protein
- Feeding too much rumen degradable (RDP) or soluble (SP) protein
- Amino acid imbalance
- Ration low in fermentable carbohydrate or non-fiber carbohydrate (NFC)
- RDP and fermentable carbohydrate are note synchronized in time
- Inefficient rumen fermentation due to subacute ruminal acidosis (SARA)
- Heat stress

High urea level (> 36 mg/dl) can be connected to the failure of conception rate by 15-20%. A high MUN value suggests that energy is being utilized to convert ammonia to urea and is being diverted from milk production. Hutjens (1996) suggests, using the Cornell model, that cows with MUN values over 42 mg/dl will produce 3,5 kg less milk.

Low milk urea (less than 18 mg/dl) or decreasing value (higher than 4 mg/dl) is caused by the key factors besides others as follows:

- Low feed intake
- Too low total crude protein or low in RDP or SP in the diet
- Feeding too much NFC
- Inefficient rumen fermentation

Milk fat content depends on many factors, like milking interval, season, number of rumination, heat stress etc. However the milk fat depression reaching the point of 2,5% milk fat content is most likely related to acidosis by most of the authors agreed. If the relative frequency is over 10% of the cows producing less than 2,5% milk fat in any heard, they most likely suffer from subacute ruminal acidosis (SARA). Our experience with farm monitoring reflects that milk urea and the occurrence of SARA are independent of quantity and contents of milk. Optimal values can be obtained by good feeding and sound management at any milk production level.

Keywords: monitoring, milk urea, protein supply, SARA

MONITORING THE MAMMARY GLAND HEALTH STATUS DURING LACTATING AND DRYING OFF PERIODS USING MILK AMYLOID A MEASUREMENT IN BOVINE MILK. APPLICATIONS: EVALUATION OF MASTITIS TREATMENT EFFICIENCY AND PREDICTION OF THE DRY COW ANTIBIOTIC THERAPY NECESSITY

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Schedule: Wednesday 11:45 AM

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The mammary gland-specific serum amyloid A 3 protein, also known as Milk Amyloid A (MAA) has been suggested in several studies as a biomarker of the inflammation of the bovine mammary gland. We conducted a study to evaluate MAA efficiency for monitoring the mammary gland health status in dairy cows during lactation and at drying off. Two data sets of results were used for this study. The first was carried out from quarter and composite milk samples collected from 528 cows. The cows originated from 8 dairy farms and were followed during six months over the course of their lactation. The samples were collected once or twice a week and some were analyzed by semi quantitative PCR to identify pathogens. During these six months, 97 cows with clinical mastitis were treated and 165 anti-biotherapies were applied. The second set resulted from quarter and composite milk samples collected from 111 cows which were enrolled at drying off (between D -2 and D -7). A second sample was carried out more than a couple of weeks after calving. All quarter milk samples of these cows were cultured for bacterial detection. All milk samples of our study were analyzed for MAA concentration and for somatic cell count (SCC). Moreover, animal recording data and health events history (clinical mastitis, antibiotic therapy, affected quarter and extramammary pathologies) were recorded. The mammary quarters from cows enrolled at drying off with an MAA concentration ≥ 1 µg/mL (n=340) were treated with an antibiotic therapy and were infused with a teat sealant. The others quarters (MAA < 1 µg/mL) were only infused with a teat sealant (n=76) or treated by antibiotic therapy and infused (n=82).

The associations between bacteriological results, animal recording data and health events history with MAA or SCC concentration results in milk samples were investigated. We worked out a diagnostic test using an MAA concentration threshold. The characteristics of this test were calculated by comparing their results to those obtained by bacteriological examination. The sensitivity and specificity are 94.5% and 93.0%, respectively. The positive predictive value is 96.3% and the negative predictive value is 89.9%. The results of our study indicate that MAA is a specific and efficient tool to detect healthy mammary quarters or a healthy udder and mammary quarters or an udder with subclinical or clinical mastitis. No effect of lactation stage, of lactation number and an extra-mammary pathology on MAA concentration was found. Our results also show that MAA allows to assess efficiency of a clinical mastitis antibiotic treatment and to follow mammary gland recovery. Moreover, this marker seems to be a good predicator of whether antibiotic treatment at drying off is necessary or not. During our study and using our MAA test, 29% of antibiotherapy could have been avoided. Using MAA analysis at drying off seems to be promising for reaching quantitative objectives of reduction of intra-mammary antibiotic application in veterinary medicine.

PREGNANCY DETECTION FROM MILK SAMPLES OBTAINED FOR ROUTINE MILK YIELD MEASUREMENTS

ATTILA MONOSTORI; KRISZTINA BÁRDOS

Schedule: Wednesday 12:00 PM

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The side effect of increasing milk production compromises the reproductive result in many high producing dairy herd in Hungary. The challenge is how to decrease the calving interval which has a detrimental effect on profitability of the dairy farm. The sooner detection of pregnancy shortens the calving intervals by identifying open cows earlier. Chemical tests for early pregnancy diagnosis that use qualitative measures of pregnancy-associated glycoproteins (PAGs) originating from the placenta have been developed and commercialized. PAGs are produced specifically by the placenta, the presence of PAGs in blood can be used to accurately determine pregnancy status. Recognizing the emerging importance of early detection of pregnancy, our company has introduced a PAG based bovine pregnancy testing from milk by IDEXX Milk Pregnancy ELISA test in April of 2013. The same sample which is routinely analyzed under milk recording procedure also can be appropriate

for PAG test. The test can be applied from the 35th day of pregnancy. Up to now, a large number of samples have been examined and the results are continuously evaluated on the basis of reported number of calving. Inclusive August 2014, 19 464 tests were performed. By the end of June 2014, 87 stocks numbering 25 149 cows were involved in the service. The efficiency of the method was verified by taking reported number of calving as "golden standard" assuming 285 days pregnancy time +/- 14 days tolerance threshold. On the basis of our rationale the test fulfills the specificity and sensitivity criteria expected from a bovine pregnancy test and might be a reliable new method in detecting bovine pregnancy.

Key words: Milk, pregnancy test, PAG, milk-recording

ESTIMATION OF THE PREVALENCE OF SUBACUTE RUMINAL ACIDOSIS IN DAIRY HERDS

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Schedule: Wednesday 12:15 PM

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Subacute ruminal acidosis (SARA) is a nutritional disorder encountered in the high-producing dairy cows. This disease appears in cases of high nutrient density diets including an increase in the proportion of concentrates and a decrease of the forage particle size. The consequences of SARA include a reduction of milk production (milk yield, milk fat, milk protein) and an increase of associated pathologies (laminitis, rumenitis, diarrhea, liver abscesses...). French milk recording organizations set up a study in order to: - developed knowledge on SARA on field conditions based on farms located in the west of France - to validate risk factors described in the literature - and to assess the sensitivity of milk fat and protein contents as an indicator of SARA. The experimental plan was articulated in two parts. In the first part, prevalence of SARA has been estimated on commercial farms. 144 dairy cows from 12 dairy herds were investigated in the West of France. In each herds, pH measurements were made on 12 selected cows using a ruminal fluid sample collected with an oro-ruminal probe. Additional measurements were: rumen fill, body condition score (BCS), faeces consistency, counting undigested maize grain and the composition of the diet. Individual milk records associated to these measurements were also collected (milk yield, milk fat and protein contents, somatic cell count). In the second part, assessment of the reliability of milk fat and protein contents as predictor of SARA was conducted using a population database with more than 350,000 dairy cows. In the surveyed farms, the prevalence of SARA is 2.1% with a pH threshold of 6.2 to define SARA. Symptoms associated with SARA in the literature were not significantly related to ruminal pH in our study. Calculated prevalence on the population database according to indicators [fat/protein<1], [0<fat-protein<3] and [fat<35] are respectively 4.60%, 8.70% and 27.10%. Indicators derived from milk fat and protein contents are not sensible and specific enough to detect low pH values.

Keywords: R.Guegan, M.Johan, L. Manciaux, J.B. Davière, J. Lefranc, Subacute ruminal acidosis, SARA, Dairy Cow, Stomach Tubing, pH, Milk Fat, Milk Protein, Milk spectra

SESSION 2: ADVISORY SERVICES BUILT ON RECORDING DATA

CHAIRMAN: NEIL PETRENY

THE ADVICE ORGANISATION IN DAIRY HERDS: EXAMPLE IN A MILK RECORDING ORGANISATION FROM WEST OF FRANCE

Schedule: Wednesday 01:30 PM

CHRISTOPHE BRUAND; JACQUES LEFRANC

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BCEL Ouest is a milk recording organization that works with more than 6,000 dairy farms located in Brittany, in the west of France. Run by farmers for farmers, BCEL Ouest directs its action and innovates to support dairy farmers to develop their performance and competitiveness as part of their operating strategy.

Our approach is to help farmers to express the genetic potential of their livestock. For this purpose, our advisors and consultants assist farmers in efficient herd management based on data and predictive indicators.

The whole data collection organization relies on operators totally dedicated to carrying out data collection regarding animal dairy performance and cattle disease frequency with a specific software supported by a Smartphone.

160 breeding advisors propose their expertise to dairy farmers on our territory (divided into 8 areas). Most of our breeding advisors have obtained a Master's degree, specializing in livestock production.

Each advisor works with 30 to 50 farms throughout the year. According to the contract signed between BCEL Ouest and dairy farmers, the breeding advisor comes between 6 to 11 times per year in the farm. Each working session takes place during 3 hours. It usually occurs after a data collection sequence which provides the recent data on the dairy animal behavior and livestock performance. Resulting from his active listening from the dairy farmer at each meeting, the breeding advisor establishes a diagnosis of main results and actions regarding the herd management. He advices breeders about:
- Herd performances analysis
- Livestock feeding and forage production: ration proposal, monitoring of the over feed cost margin.
- Forage stocks management.
- Cattle disease prevention: reproduction, milk quality and udder health.
- Herd renewal and genetic selection: heifers breeding, mating choice.
- Forecasting of milk volumes to be delivered in the next year.

The breeding advisor has a permanent access to the data of the livestock in which he operates through specific software at his disposal. Likewise, the farmer has an access to all results and reports established during the meeting from an extranet dedicated to his farm.

Each year the breeding advisor establishes a technical management annual report that allows an analysis of the strengths and issues for improvement in herd management. The compilation of these data in all farms followed by the breeding advisor or the consultant allows us to establish some technical and economic references adapted to different breeding systems. Thus, 15 different reference groups are identified according to:
- The breed of the herd
- The size of the herd
- The feed system
- The Yield per cow
- The milking system
- In summary, the activity for our breeding advisors represents:
- 45,000 professional meetings between our experts and dairy producers
- 25% of our business

DIRTY DATA THE CAUSE OF AN EMERGING DISEASE IN CATTLE FARMING. IS THERE ANY PROOF?

Schedule: Wednesday 01:45 PM

K. HERMANS; G. OPSOMER; B. VAN RANST; J. DE KOSTER; M. VAN EETVELDE; S. MOERMAN; H. BOGAERT; E. DEPREESTER; J. VAN DEPITTE; M. CAMERON[1]; M. HOSTENS

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It could be stated that data is the biggest and most powerful asset in modern dairy farming. Data is not directly meaningful, because it presents facts out of context. Only when data is put in relation with each other, information arises and knowledge can be extracted from the collected information. Hence data only has value when transformed into information and knowledge. When the value of data increases, the interest in the quality of the data increases proportionally. Incorrect data has always existed, but now the effects of it are more visible and the consequences more serious. The aim of this paper is to raise general awareness about data quality issues in cow related data collection. A literature review was conducted in order to find papers mentioning dirty data in dairy farming who complied with the dirty data types described by Li (2010). In total, ranging from 1900 to 2014, 24 articles were selected. Four articles were published prior to the year 2000, whereas half of the accepted articles were published between 2010 and 2014. Within the selected articles, 15 out of 24 (63%) described the quality of disease data. Other reported areas in which dirty data occur are fertility, genomics, medicine use, nutrition, sensors and mutation data. An outdated value was reported in 14 articles (58%) and in 7 of the articles (29%) an identity rule violation was encountered. In total 106 dirty data type cases were observed in the 24 accepted articles. In summary, 31%, 29%, 20%, 15% and 5% were reported on the dimensions completeness, accuracy, correctness, consistency and uniqueness respectively. The overall conclusion is that data quality problems are present in every aspect of cattle farming.

Key Words: Cattle, dirty data, emerging disease, big data

BENCHMARKING IN DAIRY PRODUCTION "HOW TO TRANSFORM DATA TO VALUABLE DECISION SUPPORT"

Schedule: Wednesday 02:00 PM

JOHANNES FRANDSEN

Teamleader; Agro Food Park 15; 8200 Aarhus N; Denmark

From raw data to operational daily management – examples from DMS (Danish Dairy Management System) The Danish Cattle database system has a very long tradition for collecting data within the areas of first milk recording, later reproduction, breeding and feeding. Latest registration of health data has turned into a routine business for the farmers and the veterinarians. The data sources are many; the farmers, different service people around the farm, milking and feeding equipment, dairies and slaughterhouses. Since nobody do the registration of data for fun it is important that there is a strong motivation for doing the registration. In Denmark the motivation is output in management tools, breeding evaluation and different law regulations. This very enormous amount of raw data gives good and solid background for processing of data into valuable management tools in daily operational management and periodic Key Performance Indicators. Knowledge Center for Agriculture in Denmark – owned by the farmer's organizations – has a long tradition for developing decisions support tools for the farmer at his advisors. In the dairy cattle business a management package is offered and used by more than 80% of the dairy farms, either directly by the farm manager or through the advisor. Today the package – Dairy Management System (DMS) – includes modules for registration feed ration planning and optimization, for production and economic planning, for production follow up on the production operational (day to day) and tactic level (quarterly) and this prognosis tool for prediction of the production.
For the operational management DMS offers 3 different tools to present the KPI's from processed data:
- KPI tool
- Benchmarking tool
- Reporting system with different kind of analysis on the production
With these tools the farmer can follow the daily production and benchmark against a comparable group of herds

and analyses for reasons in problematic areas presented in pedagogical graphical presentations. The tools are still under development, but are released in its first version. So far the focus has been milk production, reproduction, health and feeding.

SMART DAIRY FARMING: INFOBROKER BASES FOR SHARING DATA AND CHAIN COOPERATION

Schedule: Wednesday 02:15 PM

PIETER HOGEWERF; GERBEN DONKER[1]; KEES LOKHORST[2]; FEDDE SIJBRANDIJ[3]; MATTHIJS VONDER[4]; BART JAN WULFSE[5]

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During recent decennia systems have been introduced on the dairy farm that support the farmer in the daily management of his herd. The systems collect information of the individual cows, carry out tasks automatically and inform the farmer about deviating situations of individual cows. Most of the system only signal deviating animals but a limited number of systems give the farmer advice what he actually should do. For example based on animal activity measurements and cow information a farm management system can advise whether or not to inseminate a cow that has been detected to be in heat. Most of the systems do not at all or only on a very limited scale have the possibility to exchange information with other systems (such as e.g. the farm management software), the basic measurements are in most case only available for dedicated support software. A drawback of this approach is that there are no or very limited possibilities to combine data streams of support systems of different suppliers in order to get a more reliable signalling of deviating animals. The Dutch Dairy Farming (SDF) consortium has worked since 2011 on a proof concept on the use of sensor information, web based data exchange, decision support models and work instructions for supporting farmers and farm advisors. The first models were developed on the basis of offline data, but since mid-2014 three different models work on real time bases. The models have a work instruction based signalling function. Various companies (chain partners Friesland Campina, CRV and Agrifirm), IT companies and SME's, knowledge institutions (WUR, TNO, UU) and dairy farmers are working together in this project on the development of innovative tools in the area of animal health, fertility and nutrition. To successfully develop these tools, a platform is developed to make the real-time sensor data, from different farms and different suppliers, available to model developers. Goal is that data is made available real time web based at an individual animal level. Every hour work instructions are web based communicated with the farmer and farm advisors on smart phone, tablet and/or personal computer. The concept of an InfoBroker is designed as a breakthrough when it comes to making data stored in diverse places available in an efficient manner. The InfoBroker is capable of retrieving individual cow data from an infinite number of sources while at the same time serving a large number of models on-demand. In the InfoBroker it is specified for each farm which data may be released. This means that the farmer always stays in control. In this paper the chain cooperation and the data sharing approach will be described and introduced as a critical factor in the uptake of the smart dairy farming concept.

OPERATIVE BACKGROUND OF THE HUNGARIAN FARM MONITORING SYSTEM BASED ON MILK AND TMR ANALYSES

Schedule: Wednesday 02:30 PM

ORSOLYA PETRÁK; SZILVIA OROSZ; JULIANNA SEENGER KÓTI

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The Milk Laboratory and the Feed Laboratory (NIR) at the LPT Ltd. in Hungary are involved in a countrywide monitoring system based on TMR- and milk sample analyses. The new system was introduced in 2014 with contribution of 130 farms. The aim was to evaluate the actual nutritive value of the high milking dairy cow diet having poten-

tial effect on milk production, milk composition and animal health. Correlations between the milk and the TMR results are evaluated monthly. The farm TMR samples are taken 12 hours before the milk samples and analyzed for dry matter content, crude protein, crude fibre, crude fat, starch, crude ash, sugar, NDF, ADF, ADL, NFC, NSC, NEl, OMd, DOM, FOM, NDFd, and dNDF, pH, nitrate by NIR-technology. The milk samples routinely analyzed for fat, protein, lactose, urea, and somatic cells. Reports of the high milking TMR samples are based on the measured nutrient concentration and the presumable dry matter intake. The reports contain a figure (diagram) showing the required dry matter intake to cover the actual nutrient demand according to the measured nutrient concentration in the TMR and the actual milk yield (milk data given by the milk test). The difference among the optimal, the real and the required dry matter intake shows the inadequate/adequate nutrient concentration, the presumable effect on milk production and milk composition, animal health risk, moreover the management problem on the farm. Other important practical data about the farms are given to our experts from our technicians. Having analyzed the milk and the TMR samples a complex expert's report is being created to our customers.
Key words: TMR, monitoring system, milk recording

WEB ADVISORY TOOLS TO SUPPORT DAIRY PRODUCTION IN SLOVENIAN HERDS

Schedule: Wednesday 02:45 PM

BETKA LOGAR; JANEZ JERETINA

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A good 80,000 or nearly 80% of dairy cows in Slovenia are included in the dairy recording scheme, with an average herd size of 21 dairy cows. Recording data are collected in the central database, which is one of the main components of the Cattle Information System. In addition to recording and breeding data processing, a number of other tools to support farm management are included in this system. The aim of this article is to introduce advisory tools and services of the web portal Cattle - which are available to farmers, professional advisers and other experts - to help farmers manage their dairy herds and farms. The gate to the farm advisory tools is the 'Farm Identity Card', an application which provides summary data on the latest dairy recording of the farm. Brief information on the production, lactation and reproduction status of the herd is included, as well as information on the possible digestive disorders and excessive body reserve mobilization, based on the milk fat to protein ratio. Milk urea concentration and somatic cell count (SCC) distribution are presented in graphical form. Each section provides links to in-depth data. For example, by clicking the link for the latest milk production data, we can access in-depth information on the recordings of a particular cow. The system of the SCC presentation with values from 1 to 5 was introduced to support animal health and good welfare information concerning the SCC in herds and a particular cow. In the reproduction section of the portal Cattle, information on inseminations, expected calvings, heats and reproduction results is available. Reproduction reports for the farm can be prepared on the basis of farm management practice. To support herd-level feeding management, the system includes an application for planning feed rations, which is based on the recording data, as well as data on the nutritional value of feed, feed analyses and feeding knowledge. With its extensive volume of available data and information, easy access and presentation, the web portal Cattle is the main advisory tool used by Slovenian breeders to manage their dairy herds.

SIEL WEB

Schedule: Wednesday 03:00 PM

QUEMENER STÉPHAN

SIEL; 42 rue de Chateaudin; 75009 Paris; France

SIEL is an association of livestock advisory bodies. The object of this association is to develop programs for field advisors and farmers. In SIEL, we chose to develop a common application breeder / advisor that can be used in connected or disconnected mode. CELI WEB application is an online application in line with the overall SIEL database and based on calculated data known in CELI WEB. It allows alert, identify, analyze and compare data from one farm to groups. CELI WEB can also monitor the reproductive events of the dairy herd.
CELI WEB formats playful and interactive outcomes for members and advisors. The valuation was built around the various technical topics related to the dairy herd:

- Control results
- Analysis stage of lactation
- Food alerts
- Economic evaluation
- Udder alerts
- Reproduction alerts

A complete history for each subject on the last 13 test results used to complete the analysis. A complete animal folder classifying the events of the animal by category (Identity, Production, Repro / Calving, Health, Fattening state) provides a graphical view of the events in the life of the animal. A unique feature called "E-Board" allows the counselor to file specific alerts page views to maintain a link between the advisor and the farmer between 2 visits advice. Comparisons of groups are present on the screens inspection results, food distribution and udder alerts. The groups are managed in CELI WEB. The group composition is from the farms features (number of cows, production level, …) and a new recalculation of the farm assigned to the group is provided once a week. The data groups (averages) are, however, updates every night. The average of a group is thus the average of the last control group farms (moving average).

ON FARM RECORDING OF FERTILITY AND HEALTH DATA USING MOBILE DEVICES

Schedule: Wednesday 03:15 PM

TOMASZ STRABEL; TOMASZ NOWAK; KATARZYNA RZEWUSKA

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Cow fertility and health traits are of continues interest to breeders due to their economic importance and slow genetic progress. Optimized herd management is important for financially successful farming, it includes functional traits. Genomic selection provides new opportunities in genetic improvement of these traits by use of cow reference populations with limited number of observations comparing to national systems. Both, genetic and environmental improvement, require information collected on farms. Several sources of this type of data exist: milk recording, AI organizations, veterinarians, on-farm computer software. Unfortunately, any of them and even not all of them together usually cover all data of interest. Lack of completeness of inseminations, for example, limits their usefulness for both management and genetic evaluations. Moreover, for short term decisions (e.g. whether to continue to inseminate or not) on farm recording of fertility is regarded as probably the only practical solution as it provides fast access to information. Immediate use by the breeder of the data which is collected on farm could be, to large extend, a guarantee of their quality and completeness. It is important for the farmers and veterinarians to have quick and easy access to herd fertility data. Only then can acute fertility problems, which may be related to management, be detected and addressed promptly. Hence an Internet-based tool has been developed. A hybrid mobile/web application is proposed for online and offline collection of cow fertility data available for mobile devices. It can be run on different platforms (Android, iPhone, Windows Mobile) and PCs under various operating systems (Windows, Linux, MacOS). Capabilities of modern web browsers are utilized to enable operation without Internet connection: browser's local storage and offline web application mechanism. The central database is accessed using an HTTP API which provides possibilities for additional processing with simple tools. The system aims to collect broad range of female fertility and health data including: calving dates, insemination, fertility disorders, results of pregnancy tests and further hormone assays, heat observation, veterinary treatments, hoof trimming results and culling data. The system can be easily fed with milk production and composition data. By doing so we obtain the complete set of basic information required by nutritional and veterinary advisors. Collecting this kind of complete set of information opens opportunity for cooperation between veterinarian and nutritionist which aim to cooperate in development of this system. The system can be used for making quick management decisions, can provide information for current status of the herd and trend including recent years. By collecting adequate cow fertility and health data for complex analysis of the status of individuals and herds we hope to be able to open opportunity for genetic evaluation of new functional fertility and health-related traits with higher accuracy than offered by current national system.

SESSION 3: MANUFACTURERS SHOWCASE

CHAIRMAN: MARTIN BURKE

UPDATE ON THE IMPLEMENTATION OF ICAR ANIMAL DATA EXCHANGE STANDARDS

Schedule: Wednesday 04:00 PM

ROBERT FOURDRAINE

AgSource Cooperative Services; 135 Enterprise Drive; WI 53593 Verona; United States

The ability to collect data from the dairy farm and transmit to a centralized database has resulted in significant advances in dairy herd management and genetic progress. Traditionally the information was collected on the farm once a month by sending human resources to the farm and either collect data from paper records and key those into a data collection software program, or extract data from the on farm herd management software and load this data into the data collection software program. Users of this information have traditionally been milk recording organizations, breed registries and AI companies. However in recent years other dairy industry companies have found a need to collect data from the farm. This method of data collection has been the backbone of the genetic evaluations systems in various countries and will continue to play an important role, however with the growth in the implementation of on farm technology such as robotic milking systems, heat detection systems, feeding systems, etc. the types of data and the frequency by which data becomes available on the farm has rapidly increased. This new data and higher volume of data is providing new opportunities to capture this data and turn this data into herd management information that will further improve the farms bottom line.

In order to capitalize on using the on farm data, farmers, milk recording organizations, breed registries and other dairy industry data users need to find new and cost effective manners to obtain the data from the farm. To date most information is extracted on the farm and transmitted to another location, some level of standardization has taken place at the country level, however on a worldwide basis most data is moved by using different data file formats and little data transmission standardization has taken place.

Over the past four years the ICAR animal data exchange working group has taken on the task of establishing a standardized data interface that can be used by dairy industry partners to connect to on-farm systems extract data and transmit data to a centralized database. The standardized data interface is a two-way approach and will enhance value to the farmer and the providers of on-farm systems in addition to those providers with centralized databases. A test platform was established to allow providers of on farm technology and milk recording organizations to test software. Two data flows have been developed one starting at a datacenter to on-farm equipment and one from the on-farm system to a datacenter. Information has been identified that would be beneficial to transmit under both scenarios.

The working group is now at the stage of testing the data exchange technology with interested on farm systems providers. In parallel a complete standard is being drawn up. An update of the working group accomplishments will be provided as part of this presentation and working group members will be available afterwards to answer questions.

EXPERIENCES FROM ROUTINE CHECKING AND INSTALLATION OF MILK METERS WITH ICAR APPROVED CALIBRATION SOFTWARE MODULE FROM DELAVAL

Schedule: Wednesday 04:17 PM

OLLE SELANDER; HENRIK IDENSJÖ

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Olle Selander, M.Sc.M.E., Tech. Lic., Product Manager, DeLaval, Henrik Idensjö, M.Sc.M.E., Test center Manager, DeLaval

Using software instead of time consuming bucket milking makes this new method efficient and data continuously available for monitoring. This is a completely new and fast way of working with milk meter accuracy in terms of calibration, installation test and routine check. It has the potential to, long term, revolutionize the organization of milk recording in many regions. The method is based on a calculation in the Herd Management software of milk meter accuracy per milking point by using yield data statistics per cow and milking session as well as bulk tank receipt information. A minimum number of cow milk recordings should be registered in the software to get good statistical data before calibration. A well functioning ID system is also a prerequisite. Every farm that wants to live up to any accuracy standard regarding milk recording

need methods for milk meter calibration, installation test and routine check which are all simplified by the new method. This case study emphasizes on the evaluation of fulfillment of potential benefits of using this new method. In five cases (farm studies) in three countries (Sweden, France, Germany) the following benefits were assessed: labor savings, increased profitability, positive effect on animal welfare, reduced impact on resources, environment and energy, positive impacts on work-facilitating and work safety. The methods used were analysis of registered calibration data as well as interviews with farmers as well as workers performing milk meter calibration, installation test and routine check.

The result shows that not all potential benefits were utilized in all cases. The experiences from this study can be used to improve future organization of milk meter calibration with ICAR approved calibration software module from DeLaval.

DETECTION OF PREGNANCY-ASSOCIATED GLYCOPROTEINS IN ROUTINE MILK RECORDING SAMPLES

Schedule: Wednesday 04:34 PM

CHRISTOPH EGLI; ERNST BOHLSEN[1]

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Initial diagnosis of non-pregnancy is necessary so that cows can be re-inseminated if not pregnant to a previous AI (LeBlanc, 2013). And it is an important part of any effective reproductive management plan for modern dairy farms. On most farms, early diagnosis of pregnancy is done by a skilled veterinarian, either by trans-rectal palpation or ultrasonography of the uterus. Pregnancy diagnosis can be a problem for dairy farmers in areas where veterinary support is limited. An alternative approach is to use a pregnancy detection assay (Lawson, 2014). Recently an ELISA for detection of pregnancy-associated glycoproteins (PAG) has been commercialized. This test can be used for early pregnancy testing using routine milk recording samples from cows or goats from 28 days post breeding which facilitates workflow on the farm as the samples can be collected during milking process and cows do not need to be tied and prepared for palpation and ultrasound at any time during the day. In order to assess potential carry over from one sample to the next when using milk testers DHIA lab of LKV Weser-Ems has conducted a study on five farms. The average herd size was 116,4 cows (58 to 182). The average size of milking cows was 103,4 (51 to 161). In three herds milk samples were collected by Tru-Test milk testers (Tru-Test Group Ltd.). In one farm stationary Metatron milk tester (GEA Farm Technologies) was used and another farm used the milking robot AMV Lely A3. Samples were collected in fall 2014 on each farm. Milk volume and animal identification numbers were recorded. The milk samples were analyzed for the presence of PAGs within one day from collection. All cows that had questionable results were examined by ultrasonography. Finally results from 464 cows were analyzed. 4,7% of cows in conventional milking systems had a different result compared to ultrasonography. In the herd using the robot this value was 7,3%. Slight carry over at milk recording cannot be excluded. However, trend of deviation was from "open" to "recheck" or "pregnant". No pregnant cow was determined "open" by the milk pregnancy test when testing milk recording samples.

BLOOD BHB DETERMINATION BY INFRARED SPECTROSCOPY FOR THE MONITORING OF THE COWS METABOLIC ACTIVITY AND DETECTION OF KETOSIS

Schedule: Wednesday 04:51 PM

PIERRE BROUTIN

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Blood BHB was applied instead of Milk BHB for the monitoring of the cows metabolic activity and detection of ketosis by infrared spectroscopy. The main reasons for that was as follow: -The BHB in milk is unstable and levels very low, close to the infrared detection level. -The milk BHB content will decrease rapidly if the milk is not stored at 4oC right after milking. Thus, the determination of the milk BHB is not very reliable and only targets the Milk BHB content. The development of a calibration based on the Blood BHB allows not only to take into account the variation of the ketone bodies but also all the variations in the milk composition that are directly or indirectly linked to the metabolic disorder, in particularly the milk fatty acids profile.

MOOMONITOR+ SMART SENSING TECHNOLOGY & BIG DATA - RESTING TIME AS AN INDICATOR FOR WELFARE STATUS ON FARMS.

Schedule: Wednesday 05:08 PM

JISKA ROESSEN; CONOR BEIRNE[1]; DR. EDMOND HARTY[1]

Dairymaster; Causeway; Tralee; Ireland
[1] Dairymaster

A healthy and happy cow will produce more milk and is more likely to live longer. The European animal welfare legislations acknowledges sentience in farm animals. Dairy cows are considered sentient creatures with the right to express natural behaviour and to have provision of the animal's basic needs. Included in this is an emphasis on the owner regards animal welfare and cow comfort. Resting time can be used as an indicator of welfare in different farming systems. Resting enhances blood flow through udder tissue and the gravid uterus. It improves overall claw health while reducing stress and increasing cow comfort. This is reflected in the animal's health status and her reproductive performance and productivity. On the other hand, long bouts of increased resting time can be an indicator of welfare problems. The MooMonitor+ (Dairymaster, Causeway, Co. Kerry, Ireland) system automatically identifies different behaviourisms of the cow and is used to detect estrus, health and welfare events in cows by means of monitoring activity, feeding, rumination and resting time. Using this commercially available device a trial was set up to determine welfare status on dairy farms. This paper interprets and discusses the trial in relation to the impact of season, house design, lameness, production system and overall health on resting time.

AUTOPESEE, A FRENCH AUTOMATIC WEIGHING SCALES DEVELOPED FOR THE BEEF CATTLE PERFORMANCE RECORDING

Schedule: Wednesday 05:25 PM

LAURENT GRIFFON; PIERRE BERRECHET[1]; CHRISTOPHE LECOMTE[2]; LAURENT HEDOU[3]

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France Conseil Elevage (FCEL), the French national beef recording organization, Littoral-Normand, a local beef cattle performance recording organization and Institut de l'Elevage, the French Livestock Institute (idele), are developed an automatic weighing scales with the manufacturer Maréchalle-Pesage, the PM 6000. It consists of an electronic platform with an electronic indicator TRU-TEST XR3000 WOW and an RFID antenna. And also, the PM 6000 has a cattle crush with a mechanical system to close and to open the doors.

The aim of this product is to weigh automatically the calves inside or outside in the pasture without any human intervention, using electronic identification of the animal. The innovation was to find an autonomous system in energy to pilot the doors and to make sure that only one animal is weighed. The animal can go alone on the weighing scales and the back doors close automatically by pressing on a platform. After, the number of the animal is read and the weight is recorded. At the end, the animal goes outside by pushing the front doors and it opens the back doors for a new animal. In the pasture, the system is put in the exit of a feed station to attract the calves. Inside, we can put it between the calf shed and the resting area of cows. The weighing scales can be used for other animals like heifers and fattening bulls. During a period of trails in several farms, we obtained a good R-squared value about 0.99 between the reference weights and the weights measured by the automatic weighing scales. Inside, the rate of the weighed calves is close to 100% and outside, it reaches near 60%.

INCREASING THE VALUE AND TRACEABILITY OF MILK SAMPLES WITH NFC TECHNOLOGY: SMARTLY

Schedule: Wednesday 05:42 PM

ERIC GUEMENE

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On a mobile device with Android technology, the software is built around a modular architecture which increases the technical validation of the milk sample and data safety. SmartLY secures data collecting by writing all the information about the milk being recorded on an RFID tag. Emphasising the traceability of data is essential to increase competitive differentiation. Data entered are both written on the RFID tag and uploaded on the database of the milk recording company (Eilyps). The aim is for a quick recovery of all data.

NFC technology can be used to sort milk samples and by consequence multiplexing the number of analyses for the same sample. So this increases the differentiation in demands for dairy industries or farmers.

The different modules of the software are:

- Milk recording module : developed for milk recording and data collecting (MG, MP, Somatic Cells, Urea, Lactose).
- Other Analyses module: with special information on the tag, it is possible to pick out samples and make some different analyses according to the desires of the breeder during milking.
- Health module: animal health information can be collected during milk recording. It is possible to compare information between the sample and health events.

NFC technology integrates all the processes from taking the sample to data processing and one of the most important operators which is the laboratory. This application is a good way to improve milk info and dairy farm management. RFID is the best solution to identify a sample in a hostile environment, it is possible to work in high and low temperatures, to read and write information with a tag plunged into the milk sample.

Application of RFID can create flexibility and efficiency in a milk recording chain able to meet all relevant developments and future needs for all companies using milk samples.

SESSION 4: MILK RECORDING IN CATTLE, MEAT AND FIBRE PERFORMANCE IN SHEEP, GOATS AND BEEF CATTLE

CHAIRMEN: PAVEL BUCEK; LAURENT JOURNAUX

WORLDWIDE TRENDS IN MILK RECORDING IN CATTLE

Schedule: Thursday 08:00 AM

PAVEL BUCEK; KARL ZOTTL[1]; JUHO KYNTÄJÄ[2]; FILIPPO MIGLIOR[3]; HÉLÈNE LECLERC[4]; JAPIE VAN DER WESTHUIZEN[5]; KAI KUWAN[6]; YANIV LAVON[7]; KEVIN HAASE[8]; CARLOS TREJO[9]; DANUTA RADZIO[10]; ELSAID Z. M. OUDAH[11]

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In recent years we have seen many changes to milk recording in cattle along with rapid technological development. It was decided that Dairy Cattle Milk Recording Working Group would update ICAR Guidelines Section 2, which focuses on milk recording, and to organise a world-wide survey to cover all relevant territories around the world, including ICAR and non-ICAR members. It is essential to prepare a new version of the ICAR Guidelines on the basis of sophisticated and relevant analysis. This survey is an official project of the ICAR Dairy Cattle Milk Recording Working Group and features a wide range of the most important ICAR and non-ICAR members. At the end of January, 41 organisations have agreed to complete the questionnaire, representing 198 organisations and 17,621,061 cows covered in this world-wide survey. It is expected that at the end of February, on the basis of preliminary communication, 47 organisations will complete the survey. A list of the participants with their name and relevant contacts will be available in manuscript, PowerPoint presentation and brochure form, to be published after the ICAR meeting in Krakow. The Dairy Cattle Milk Recording Working Group acknowledges and thanks all participants in the survey and for their feedback, which was used in the project. This survey was prepared on the basis of a questionnaire with 106 questions covering the most important parts of milk recording and with the collaboration and feedback of milk-recording organisations involved in the project. We have created a methodology on how to edit these data.

The main goal of this part of the survey is to analyse methodological aspects of milk recording, which are covered in ICAR Guidelines Section 2 and to analyse approaches used in data capture, milk-recording identification, sample transport, milk-recording methods, sampling, calculation of 24-hour milk production, lactation calculation and other relevant methodological milk-recording details. These results are important in order to monitor the situation in milk-recording organisations. They also serve as a basis for changes and improvements to the ICAR Guidelines and to identify new approaches. They are also useful for the ICAR Guidelines in defining new needs of milk-recording organisations, while also being valuable for participating countries, providing feedback and comparison of the most common milk-recording practice in ICAR and non-ICAR member organisations. Results of this survey can offset changes in different milk-recording organisations. Another benefit of the project is the strengthening of collaboration survey could serve as an inspiring document for the work of milk-recording organisations. This survey also caters for the different structures, environment, management, economic conditions and practical responses to the requirements and needs of milk-recording organisations.

WORLDWIDE TRENDS IN MILK RECORDING: MILK RECORDING AND NEW TECHNOLOGIES

Schedule: Thursday 08:10 AM

JUHO KYNTÄJÄ; PAVEL BUCEK[1]; KARL ZOTTL[2]; FILIPPO MIGLIOR[3]; KAI KUWAN[4]; YANIV LAVON[5]; HÉLÈNE LECLERC[6]; JAPIE VAN DER WESTHUIZEN[7]; KEVIN HAASE[8]; CARLOS TREJO[9]; DANUTA RADZIO[10]; ELSAID Z.M. OUDAH[11]

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This paper is part of the survey "World-wide trends in milk recording", initiated and carried out by the ICAR Working Group on Dairy Cattle Milk Recording. The survey was participated by 41 organisations representing 198 milk recording providers who record data from a total of 17.6 million cows. According to recent communication, it is expected that the number of participating organisations will rise to 47.

Recent years have provided farmers and milk recording organisations with numerous new possibilities to gather data and measurements about their cows. In this study, we will look at how these possibilities are being utilised now by both farmers and milk recording organisations, and how are the organisations planning to use them in the near future. We will consider automatic measurements on the farm but also new analytical services in the milk recording laboratory.

WORLD TRENDS IN MILK RECORDING MANAGEMENT AND ORGANIZATION

Schedule: Thursday 08:20 AM

KARL ZOTTL; PAVEL BUCEK[1]; JUHO KYNTÄJÄ[2]; HÉLÈNE LECLERC[3]; CARLOS TREJO[4]; KEVIN HAASE[5]; YANIV LAVON[6]; KAI KUWAN[7]; JAPIE VAN DER WESTHUIZEN[8]; FILIPO MIGILOR[9]; DANUTA RADZIO[10]; ELSAID Z.M. OUDAH[11]

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This paper is part of a project organized by the ICAR Dairy Cattle Milk Recording Working Group in collaboration with ICAR and non-ICAR member organizations. The project is based on a survey which covers the most important part of the ICAR Guidelines – Section 2 – and includes 106 questions on methodologies used in milkrecording in cattle, management and organization, key processes in milk-recording and views towards the future. It is primarily concerned with monitoring current trends, implementing new technologies and analyzing new methodologies with regard to management and organization. This survey covers all territories around the world. By the end of January, 41 organizations will have agreed to complete the questionnaire, representing 198 organizations and 17,621,061 cows in this world-wide survey. It is expected that by the end of February, on the basis of preliminary communication, 47 organizations will have completed the survey.

The Dairy Cattle Milk Recording Working Group acknowledges and thanks all participants involved in the survey and for their feedback, which has been used in the project. Their support and enthusiasm in discussing the project and in providing data for analysis is greatly appreciated. The full list of countries and experts in active participation will be available in manuscript, PowerPoint presentation and brochure, which include a complete overview of the results of the project. The project will summarize overall results and fully respect data protection requirements. The management of recording organizations in the current competitive climate is now more challenging than ever. In order to provide a global overview of the surroundings and detail the answers given by involved organizations, this survey will include some areas that cover management and organizational questions. The main part of this approach is how to develop a clear relationship with customers and how to provide value to farmers in regard to collected data and samples. New tools of analysis are already very common in some countries, while other participants are now focusing on maximizing increased efficiency in data capturing and processing. In those countries whose workflow is technician-based, training and certification are major components in improving human resources.

The reporting of results back to farmers is also a very challenging area. The use of paper and pdf-reports is very common, but new online technologies and smartphone usage now affords new opportunities for farmers to manage information. Real value is created by additional analyses from milk samples. This challenging environment requires innovation in the area of milk-recording management. Some promising approaches from our survey will surely provide fresh ideas to all of our colleagues facing these challenges.

INNOVATIONS IN SHEEP PERFORMANCE RECORDING IN NEW ZEALAND

Schedule: Thursday 08:45 AM

ANDREW COOKE; MARK J YOUNG[1]; GRAHAM ALDER[1]; JOHN W DAVYS

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[1] B+LNZ Genetics; 442 Moray Place, Dunedin; New Zealand

Sheep performance recording in New Zealand commenced in the late 1950s and early 1960s with a sole focus of producing genetic improvement in the national flock. The first selection index was produced in 1961. Since that time, New Zealand has operated a number of national sheep recording schemes with the

current "Sheep Improvement Limited" (SIL) service operating since 1998. The service is now incorporated into B+LNZ Genetics, a subsidiary of the farmers' levy-funded organisation, Beef + Lamb New Zealand.

In 2014 B+LNZ Genetics commenced a substantial programme to upgrade the SIL system, to improve accuracy of data collection through electronic identification and in-field recording tools, to increase size of the genetic evaluation, and to integrate the use of SNP data into a single-step breeding value calculation.

New web and mobile tools are being developed to encourage better use of genetic information by commercial farmers and livestock agents, supported by an extension programme. New mobile and in-field data collection tools are being developed to streamline the process of performance recording by breeders. Research work is being undertaken to improve the prediction of lean meat yield and to include ewe longevity (stayability) and maternal body condition score (BCS) in the traits evaluated.

ORGANIZATION OF MILK RECORDING IN GOATS IN FRANCE

Schedule: Thursday 09:00 AM

AGNES PIACERE; VIRGINIE CLEMENT; XAVIER BOURRIGAN[1]; CHRISTOPHE LECOMTE[2]

Institut de l'Elevage; BP 42118; 31321 Castanet-Tolosan Cedex; France
[1] Institut de l'Elevage; BP 85225; 35652 Le Rheu Cedex; France
[2] France Conseil Elevage; 42 rue de Chateaudun; 75009 Paris; France

In France, milk recording for goats began in the 1960s, with the same method as for cows but by measuring nitrogen content instead of fat content, in order to adapt breeding goals to the commercial objective, cheese production exclusively. Since the 1980s, both fat and protein contents have been measured, and somatic cell count since the 1990s. The first method used for goats was the monthly recording scheme, with measure of both daily milk yields, and a single sample half part for both milkings. Progressively, milk recording has become more popular among breeders. The implementation of a breeding scheme for Alpine and Saanen goats in the 1980s contributed to increase the demand for goat milk recording : the number of recorded goats was multiplied by 3 within 20 years, and reached 300 000 goats in the 2000s.

Obviously milk recording schemes had to be adapted to the different technical needs of the farmers and to the logistic constraints of the Milk Recording Organizations ("MROs"), due to the large heterogeneity of herd densities and of herd sizes within the country. New procedures were implemented; they allow larger periods between two records and the measure of one milking only, alternatively morning or evening. Since 1992, farmers can choose among four methods (A4, A5, AT4, AT5, according to the ICAR terminology). Moreover, farmers who are not interested in getting genetic evaluations for their goats can choose another simplified and less expensive method. However, for few years, MROs, helped by Institut de l'Elevage, have been looking for new schemes, that would simplify their work and that would be more flexible, if possible without any loss of accuracy. The main issue of the AT procedure is the obligation to get records morning and evening alternately, which is sometimes difficult to organize. Therefore the present work aims at estimating daily milk, fat and protein yields and contents by using Liu's approach, from results obtained during one milking only and from estimated coefficients, according to period between two milkings, stage of lactation and parity. Regression coefficients were obtained from a training dataset of 28,700 daily results of 5,500 goats, for which morning and evening performances were both available. Then, on an independent validation dataset of 1,700 goats, two approaches were used to estimate performances of each lactation: i) the current AT scheme (which assumes that each milking represents 50% of the daily yield); ii) a new recording scheme (called AC), in which all the records are those obtained either mornings, or evenings, and in which daily performances are estimated by using Liu's coefficients computed with the training dataset. Results show that protein yields and contents are accurate and unbiased in all the situations. The accuracy is lower for fat and the bias is larger, but AT and AC results are comparable. This is why the AC approach will be proposed for an agreement by ICAR and it will be used by the French MROs in a near future.

A second issue is the acceptable period between two records: at present French A4 and A5 schemes require to keep the intervals in a set of precise bounds. In the near future, these constraints should be replaced by a requirement on the average period between records, computed within the first 250 days or within two periods (until the lactation pick and after). With these changes, the French renewed organization of goat milk recording will be more flexible and thus better fitted to the demand. But performances estimated with the various proposed schemes being not at the same level of accuracy, a study is engaged by MROs and Institut de l'Elevage in order to find the most appropriate way to publish the results in order to help farmers to interpret the performances according to their accuracy.

BEEF DATA RECORDING IN IRELAND: CURRENT EXPERIENCE AND FUTURE POTENTIAL OF AN INDUSTRY INTEGRATED NATIONAL DATABASE

Schedule: Thursday 09:15 AM

CHRISTOPHER DALY

Irish Cattle Breeding Federation (ICBF); ICBF, Highfield House, Bandon, Co. Cork, Ireland; 1234 Cork; Ireland

Ireland's experience with farmer based beef data recording has been a positive one, particularly in the last 8 years with the introduction of state funded schemes to promote the collection and submission of on farm data. This, along with data sharing between cattle auctions, meat processors, herd book organisations, the Irish Department of Agriculture and the Irish Cattle Breeding Federation (ICBF) has resulted in a truly centralised integrated database. The challenge for the ICBF and the wider industry, is to ensure that these data flows continue and grow into the future, even in the possible absence of state funded schemes.

IMPLEMENTATION OF NEW MILK RECORDING PRACTISES IN FINLAND

Schedule: Thursday 09:30 AM

HELI WAHLROOS; SANNA NOKKA; JUHO KYNTÄJÄ[1]

Association of ProAgria Centres; P.O. Box 251; 01301 Vantaa; Finland

[1] Agricultural Data Processing Centre, P.O. Box 25, 01301 Vantaa, Finland

For the last two years, ProAgria has been running a development project on milk recording. The aim of the project is to improve data capture, data quality and use of data in order to give more value to the farmers. In the beginning of the year 2015, many developments have been implemented. Those relate to yield calculations, reporting and customer services. As an example, more variety in recording intervals was introduced, data capture from AMS farms changed from monthly sum to 24-hour milk yield, data quality points were introduced as a motivating data quality supervision tool, and technical staff was trained to offer services in milk recording. We are still in the process of improving milk recording reports and customer services. A wide range of stakeholders has been involved in the project. ProAgria and many of the stakeholders have made large investments in order to achieve the project aims. Such a major reform of milk recording requires a vast amount of training to the staff and farmers. The project has been challenging in terms of communication, since many in the business had to implement new procedures. A lot of attention has been paid to continuous monitoring and quick response to customer feedback. The effect of the developments on customer satisfaction can be assessed more fully at the end of the milk recording year.

SESSION 5: GENOMICS AT FARM AND PHENOTYPING STRATEGIES

CHAIRMAN: MIKE COFFEY

RECORDING OF CLAW AND FOOT DISORDERS IN DAIRY CATTLE: CURRENT ROLE AND PROSPECTS OF THE INTERNATIONAL HARMONIZATION INITIATIVE OF ICAR

Schedule: Thursday 10:30 AM

CHRISTA EGGER-DANNER; CHRISTER BERGSTEN[1]; ANNE-MARIE CHRISTEN[2]; CECILIE ØDEGARD[3]; KEELIN O'DRISCOLL[4]; JENNIE PRYCE[5]; ADRIAN STEINER[6]; KATHRIN STOCK[7]; GILLES THOMAS[8]; KARIN ULVSHAMMAR[9]; OTHER ICAR WGFT MEMBERS, AND INTERNATIONAL CLAW HEALTH EXPERTS[10]; JOHANN BURGSTALLER[11]; NYNNE CAPION[12]; NOUREDDINE CHARFEDDINE[13]; PIA NIELSEN[14]; KERSTIN MÜLLER[15]; JOHANN KOFLER[11]; GERALD CRAMER[16]; BJORG HERINGSTAD[17]; TERJE FJELDAAS[18]; ANDREA FIEDLER[19]; DOERTE DOEPFER[20]; VICTOR DANIEL[21]; JONATHAN CLARKE[22]; ERIKA OAKES[23]
ZuchtDAta EDV-Dienstleistungen GmbH
[1] Swedish University of Agricultural Sciences, Sweden
[2] Valacta, Canada
[3] Geno, Norway
[4] Teagasc, Moorepark, Ireland
[5] Department of Environment and Primary Industries and La Trobe University, Agribio, Bundoora / Victoria, Australia
[6] University of Bern, Vetsuisse Faculty, Switzerland
[7] Vereinigte Informationssysteme Tierhaltung w.V. (vit), Verden, Germany
[8] Institut de l'Élevage, France
[9] Växa, Sweden
[10] other ICAR WGFT members, and international claw health experts
[11] Veterinary Medical University, Vienna, Austria
[12] University of Copenhagen, Denmark
[13] Conafe, Spain
[14] Knowledgecentre for Agriculture, Denmark
[15] Freie Universitaet Berlin, Germany
[16] University of Minnesota, United-States
[17] Norwegian University of Life Sciences, Department of Animal and Aquacultural Sciences, Ås, Norway
[18] Norwegian University of Life Sciences, Norway
[19] Association of certified hoof trimmers, Munich, Germany
[20] University of Wisconsin in Madison, WI, United States
[21] Hoof trimmer, Canada
[22] SKS Foot trimming Services Ltd, United Kingdom
[23] Dairy Australia, Australia

Claw and foot disorders causing lameness are among the major culling reasons in dairy cattle around the world. These problems play a significant role in farm profitability and compromise animal welfare. In recent years, several countries have started routine recording of claw health data. Documentation of claw health status during regular claw trimming has been identified as a valuable source of information on feet and legs conditions in single cows and can also provide an important insight into the health status of the entire herd. However, heterogeneous documentation practices complicate the routine collection of claw health data and consequently the use of the data. To document the current situation of recording and the use of claw health data among ICAR member countries, the ICAR Working Group for Functional Traits (ICAR WGFT) carried out an online-survey during August and September 2014. Responses from 18 countries showed that half of them have a single national key for recording claw and foot disorders. Information is collected on 6 to 20 different disorders, in many cases including severity grades using numeric or descriptive recording and affection sites. Professional claw trimmers are the main source of data collection often using hand-held electronic recording systems and customized software. Digital dermatitis, white line disease, sole ulcer, interdigital phlegmon (foot rot) and interdigital hyperplasia (corns) followed by sole hemorrhage are among the most commonly recorded disorders. Routine genetic evaluation for claw health has been implemented in the Nordic countries in 2010 (Denmark, Sweden and Finland) and Norway (2014)). The Netherlands publishes breeding values for claw health since 2010. Other countries like Canada, Spain, and France have successfully set up recording schemes for claw health information. Plans to start such projects do exist in other countries as well.

To be able to make comparisons of claw health between countries and for breeding purposes, the harmonization of the terminology of claw disorders is required. Since May 2014, ICAR WGFT has been engaged in a collective effort involving international claw health experts and interdisciplinary collaborators to compile harmonized definitions for several claw disorders along with representative pictures. The focus is on descriptive findings. The objective is to establish an international claw health atlas which can guide future developments towards better claw health data that can be used to improve management and breeding of dairy cattle.

This paper gives an overview on the recording of claw and foot disorders in dairy cattle with a focus on aspects of breeding and presents the results and prospects of the work of the ICAR WGFT and international claw health experts on harmonization of terminology and definitions of claw disorders.

EFFICIENT COW - STRATEGIES FOR ON-FARM COLLECTING OF PHENOTYPES FOR EFFICIENCY TRAITS

Schedule: Thursday 10:50 AM

FRANZ STEININGER; CHRISTA EGGER-DANNER[1]; KARL ZOTTL[2]; MARTIN MAYERHOFER[3]; WERNER ZOLLITSCH[4]; MARIA LEDINEK[5]; LEONHARD GRUBER[6]; BIRGIT FUEST-WALTL[7]; CHRISTIAN FUERST[3]
ZuchtData EDV-Dienstleistungen GmbH, Dresdner Str. 89/19, 1200 Vienna, Austria
[1] ZuchtDAta EDV-Dienstleistungen GmbH
[2] LKV Gesmbh, Vienna
[3] ZuchtData EDV-Dienstleistungen GmbH
[4] University of Natural Resources and Applied Life Sciences
[5] University of Natural Resources and Life Sciences Vienna
[6] Institute for farm animal research
[7] University of Natural Resources and Life Sciences, Dep. Sust. Agric. Syst., Div. of Livestock Sciences, Gregor-Mendel-Str. 33, 1180 Vienna, Austria

Under the condition of limited resources production systems have to adopt their strategies for producing milk and beef. Especially the competition on farmland and the resulting higher prices for concentrated feed causes a higher interest in increasing efficiency. The Association of Austrian Cattle Breeders (ZAR) started the project "Efficient Cow" in 2013. The aim of the project is to evaluate the possibilities for genetic improvement of efficiency in cattle breeding under Austrian circumstances.

Efficiency is seen as a combination of already existing traits: milk, beef and functional traits and traits aiming at feeding efficiency and health. In the year 2014 a one-year data collection was conducted. Data of approximately 5.400 cows (3.100 Fleckvieh (Simmental), 1.300 Brown Swiss, 1.000 Holstein) kept on 167 farms were recorded. In addition to routine performance recording, new traits like body weight, body measures (body condition score, chest circumference, …) and data about feed quality, feed intake and health (lameness scoring, ketosis milk test, claw health, …) were collected all over the year. 3.000 cows with complete data recording are being genotyped.

The next steps are to estimate genetic parameters for newly defined efficiency traits and genetic correlations to other traits within the total merit index. Another aim is to evaluate the context of body weight and feed efficiency. A further project aim is modelling the effect of different milk production systems on greenhouse gas emission based on individual animals under Austrian circumstances. Possibilities to increase efficiency in cattle breeding as well as to reduce emissions indirectly will be analysed.

Presently it seems not applicable to record direct traits for feed efficiency and methane emissions on station from a sufficient number of cows to be used for breeding purposes under Austrian circumstances.

By collecting this wide range of different information on the project farms, the approach is to find auxiliary traits that are easier and cheaper to measure than the direct traits. Especially automatically collected data from milking and feeding systems could be a new data source for routine phenotypes. But also a structured recording of different management tools like body condition or lameness scoring on a limited number of cows would be a good starting point for further developments of Austrian dairy cattle breeding programs.

SNP SELECTION FOR NATIONWIDE PARENTAGE VERIFICATION AND IDENTIFICATION IN BEEF AND DAIRY CATTLE

Schedule: Thursday 11:10 AM

MATTHEW MCCLURE; MICHAEL KEANE[1]; KARL O'CONNELL; PAUL FLYNN[2]; FRANCIS KEARNEY[1]
JOHN MCCARTHY[1]; KARL O'CONNELL

Irish Cattle Breeding Federation; Highfield House, Shinagh, Bandon, Co. Cork, Ireland
[1] ICBF
[2] Weatherbys, Naas, Ireland

As parental verification in agriculture moves from microsatellite- to single nucleotide polymorphism (SNP)-based methods, the accuracy of pedigree verification will increase if robust methods and high quality SNP are used. In beef and dairy cattle, the international standard for SNP-based verification has been to use the ISAG100 or ISAG200 SNP set for Bos taurus breeds. We show that while these SNP sets do provide a higher level of accuracy than microsatellites, more SNP should be used for parentage verification and prediction, and some SNP should not be used due to genotyping quality. The Irish Cattle Breeding Federation (ICBF) is in the unique position of having both beef and dairy genotypes on Irish cattle, and through recent government schemes a large portion of ICBF genotypes come from commercial herds which have both purebred and crossbred animals. By analyzing different SNP levels across beef and dairy cattle, we were able to determine that at a minimum >500 SNP are needed to consistently predict only one set of parents. If only the ISAG200 SNP are used for parentage prediction, then >1 sire or dam can be predicted at <1% misconcordance rate levels. Since if >1 parent can be predicted using the ISAG200 SNP set, then in theory it is also possible to validate the wrong parent for an animal. ICBF currently uses 800 SNP for parentage validation and prediction, which are comprised of the ISAG200 panel and the top 600 SNP based on their minor allele frequency (>0.47) and SNP genotyping quality in >160,000 Irish beef and dairy animals. Recent analysis of SNP clustering patterns in BeadStudio show that some SNP, including those of the ISAG200, have clustering issues which only become apparent when thousands of samples from multiple breeds are analyzed together. The selection of this larger set of high quality SNP that performs across multiple breeds will permit increased accuracy for pedigree verification and identification.

PHENOTYPIC ASSOCIATIONS AND GENETIC CORRELATIONS BETWEEN CLAW HEALTH DISORDERS AND, MILK PRODUCTION, FERTILITY, SOMATIC CELL SCORE AND TYPE TRAITS IN HOLSTEIN SPANISH DAIRY CÁTTLE

Schedule: Thursday 11:30 AM

NOUREDDINE CHARFEDDINE; MARIA ANGELES PÉREZ-CABAL[1]

Animal Breeding; Apdo 31; 28340 Madrid; Spain
[1] Departamento de Producción Animal, Universidad Complutense de Madrid, 28040 Madrid, Spain

In 2012 a centralized electronic recording system called I-SAP for claw disorders was implemented in Spain, and genetic parameters for claw disorders were estimated for dermatitis (DE), sole ulcer (SU), white line separation (WL), interdigital hyperplasia (HP), interdigital phlegmon (PH), and chronic laminitis (CL). With the final aim of improving the Spanish selection index in the next future, the objective of the present study is to estimate genetic correlations between claw disorders and feet and legs traits, production traits, and functional traits, as somatic cell score and days open in Spanish dairy cattle. In addition to the six lesions mentioned above, a combined trait called overall claw disorder (OCD) was also included. This trait refers to the absence or the presence of at least one of the six claw lesions. A total of 49,963 claw health records corresponding to 35,337 cows with conformation data on feet and leg traits, yield data (305-d first lactation milk, fat and protein), somatic cell score, and days open between the first and the second calving in first lactation were used. Genetic correlations were estimated using REML methodology fitting a multi-trait linear animal model. Although some type traits regarding feet and legs seemed to be more correlated to specific lesions, such as foot angle with chronic laminitis and white line disease, in general, cows with a good locomotion score are less likely to claw lesions. As expected, high yielding cows were more prone to claw disorders, especially to chronic laminitis. Our results showed a positive relationship between claw health problems and poor fertility, as well as higher somatic cell score in animals affected by sole ulcer.

GUIDELINES TO MEASURE INDIVIDUAL FEED INTAKE OF DAIRY COWS FOR GENOMIC AND GENETIC EVALUATIONS

Schedule: Thursday 11:50 AM

ROEL VEERKAMP; MIKE VANDEHAAR[1]; DIANE SPURLOCK[2]; MIKE COFFEY[3]; JENNIE PRYCE[4]; YVETTE DE HAAS[5]

ABGC Wageningen UR; P.O. Box 338; 6700 AH Wageningen; Netherlands
[1] Michigan State University, East Lansing, US
[2] Iowa State University, Ames, US
[3] SRUC, Edinburgh, United Kingdom
[4] DPI & DFCR, Bundoora, Victoria, Australia
[5] ABGC, Wageningen UR Livestock Research, Wageningen, the Netherlands

The widespread use of genomic information in dairy cattle breeding programs has presented the opportunity to select for feed intake and feed efficiency. This is because animals from research herds can be used as a referencepopulation to calibrate a genomic prediction equation, which is then used to predict the breeding value for selection candidates based on their own genotype. To implement genomic prediction and perform genetic analysis for feed intake, several consortia have bundled their expertise and existing feed intake records. Based on that experience we aim to provide some guidelines on the recording and handling of these feed intake records. The consortia used a mixture of standardised experimental data coming from larger genetic experiments or several smaller nutritional studies. The latter provide some statistical challenges. Also, data was combined across countries, experimental herds and feeding systems. Despite the perceived roughness of such existing data, it has proven to be very successful for genomic prediction, with properstatistical modelling. Ideally the whole lifetime of all cows should be measured, but this is unrealistic. Often, animals are recorded for part of one (or more) lactation(s) only. This was handled by the different consortia quitedifferently. Guidelines on the proper statisticalmodelling and usefulness of existing data are needed. Selection index theory is the best mechanism to establish the optimal recording period across and within lactation. Simply using part-whole correlations with the maximum period that intake was recorded provides misleading confidence. It is also critical to identify how many records are required and what are the most informative animals for measuring feed intake. Genetic relationships with the selection candidates are an important criterion.Finally, since feed intake is only part of the breeding goal, it is important to consider recording of other traits as well, since the genetic parameters are needed to define the breeding goals properly.

MAXIMIZING GENETIC PROGRESS IN THE NEW AGE OF GENOMICS

Schedule: Thursday 12:10 PM

ROBERT FOURDRAINE

AgSource Cooperative Services; 135 Enterprise Drive; WI 53593 Verona; United States

Genetics has historically played a minor role in day-to-day herd management when compared to nutrition, udder health and reproduction. Genetic progress for most US dairies consisted of selecting AI sires that might improve the herd's main deficiencies, like production, feet and legs or udder composite. Culling low genetic merit cows was not an option because most dairies had insufficient heifer inventories to replace the low genetic value animals while maintaining herd size. Modern technology offers a growing list of options when it comes to genetics decision making. With the introduction of genomic testing and sexed semen, managing herd genetics is no longer a minor part of the day to day herd management. With the variety of tools available, producers have to ask the question; am I maximizing genetic progress while managing inbreeding? AgSource provides 4 tools to assist producers with their genetic program decisions.

Genetic Summary Report
Introduced in 2014, the Genetic Summary Report (GSR) provides a 4 page analytical tool that features 13 different analysis focused on maximizing genetic performance while minimizing inbreeding. Amongst the many features, the report provides a comparison of the current herd genetics against AgSource's 80th percentile active cows and heifers, a genetic progress trend graph by year of birth, herd average genetic values by testday for cows and service sires, youngstock genetic analysis, and a performance analysis of the herds top 12 bulls based on number of daughters. The report features many benchmarks allowing the producer to measure how well they are doing compared to other herds. The GSR allows a producer to review the historic trend of inbreeding in the herd, identify the top 10 most genetically prominent bulls in the herd, and see the distribution of inbreeding level for the herd's cows and heifers.

Genetic Selection Guide

The AgSource Genetic Selection Guide reports provide producers with the power to maximize the future genetics in the herd using both genotypic and phenotypic information to make replacement, breeding and genomic testing decisions. The genetic selection guide uses Net Meritdolar (NMdolar) which is the most widely accepted US measure of a cow or heifer's genotypic ability to produce milk over a lifetime. All three Genetic Selection Guides divide animals into quartiles based on their NMdolar. The Progeny Genetic Selection Guide provides producers with a planning tool that will provide them with genetic information about future progeny before the calf is actually born. The report includes up to 8 months worth of progeny, including an estimation of where progeny will genetically rank based on their expected NMdolar value. Having information available prior to birth will allow producers to make projections about how many calves to keep, which calves to keep, and which calves could be genomically tested. Knowing ahead of time which calves to keep will reduce expenses and provide opportunities for genomic testing and optimize genetic progress.

When combined, the Genetic Summary Report and the Genetic Selection Guide reports provide US producers and AI representatives with 4 state of the art tools to monitor a herd's genetic program and make the most informed replacement and breeding decisions.

SESSION 6: COQ AUDITORS' WORKSHOP

CHAIRMAN: CHARL HUNLUN

DATA REQUIREMENTS FOR MANAGEMENT AND BREEDING PURPOSES IN DAIRY CATTLE

Schedule: Thursday 01:30 PM

FRIEDRICH REINHARDT

Vereinigte Informationssysteme Tierhaltung w.V.; Heideweg 1; 27283 Verden / Aller; Germany

An interactive workshop session where the data requirements for management and genetic evaluations will be practically demonstrated and discussed.
This is an open session and can be attended by all delegates.

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CONTENTS

SOCIAL EVENINGS

WELCOME COCKTAIL AT KRAKOW TOWN HALL

After the reception the participants will have a possibility to enjoy the uniqueness of the Old Town's atmosphere by having dinner in one of the restaurants and tasting Polish cuisine and its specialities.

Wielopolski Mansion – called "a palace" in Polish – was built in the first half of the 16th century, as an elegant Renaissance residence. Windows with characteristic divisions and stone frames and a crenellated parapet wall survive from that period. In 1864, the Palace was purchased by the Municipality of Kraków as headquarters for the Municipal Offices. The ballroom on the second floor was at that time replaced by the elegant Assembly Hall. The rooms used for official functions were decorated in historicist style in the spirit of the Viennese Art Nouveau making use of motives taken from folk art. In 1926, the Main Assembly Hall was consumed by fire yet was meticulously restored within the space of several months, respecting the original designs, but at the same time embellishing them in Art Déco style, fashionable at the time.

Date: Wednesday, 10 June 2015

Time: 19:00

Location of event: Town Hall – Wielopolski Palace, Plac Wszystkich Świętych 3-4, Kraków

Dress code: Informal

Sponsored by: Bretagne Conseil Elevage - Ouest

GALA DINNER AT WIELICZKA SALT MINE

Gala dinner is organized in the historic chambers of the Salt Mine considered one of the wonders of the world. Put by UNESCO on the World Cultural Heritage list in 1978. Tourist route on three levels of the mine covers ca half a mile of corridors, 20 chambers carved in salt, all on the depth from 70 to 135 m. St. Kinga's Chapel is a breathtaking place - a church where everything is made of salt - crystal chandeliers, altars, sculptures and floor paving carved in the layer of salt.

The Mine is located at a distance of 0,5h's trip from the conference facilities, therefore busses will bring the participants to Wieliczka. After the Gala Dinner busses will take the participants back to the hotels.

The Dinner will be preceded by a brief (45 minutes) tour aiming at discovering the traditions and history of the Wieliczka Mine.

The Gala Dinner will take place in Waszawa Chamber characterized by a stunning combination of nature and... architecture. This is a chamber of an impressive size, which was exploited in the nineteenth century, with a total of 20,000 tons of salt excavated. Warszawa Chamber, located at the breathtaking 125 meters underground will gain a new, unique dimension of the ICAR 2015 Gala Dinner.

Date: Thursday, 11 June 2015

Time: 18:00 – depart by buses from Holiday Inn Kraków City Center (conference venue),

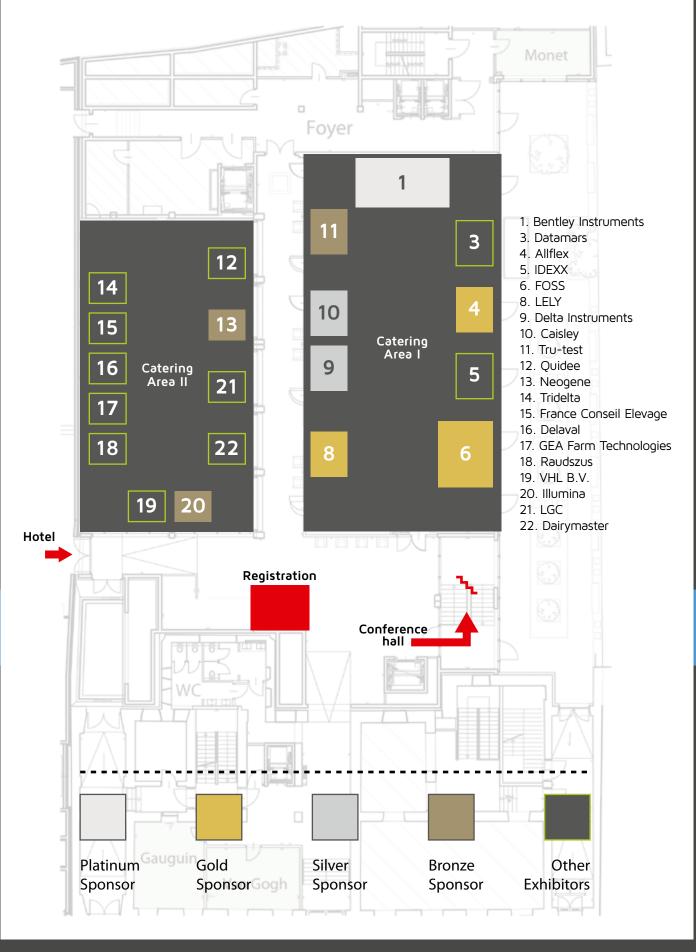**Location of event:** Wieliczka Salt Mine, ul. Daniłowicza 10, Wieliczka

Dress code: Informal/Formal – Bring warm clothing. The temperature underground is steady and ranges between 14° and 16° C.

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EXHIBITION AREA

Monet

Foyer

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Catering Area II

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1. Bentley Instruments
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5. IDEXX
6. FOSS
8. LELY
9. Delta Instruments
10. Caisley
11. Tru-test
12. Quidee
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15. France Conseil Elevage
16. Delaval
17. GEA Farm Technologies
18. Raudszus
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20. Illumina
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Conference hall

WC

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ICAR
Chile 2016

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Puerto Varas, the tourist capital of southern Chile, was dealt a generous hand by nature. Located beside Lake Llanquihue, the third largest in South America, Puerto Varas enjoys a stunning natural landscape with exuberant forest, the majestic Osorno volcano and the emerald green waterfalls of the Petrohue river.

The architecture of Puerto Varas bears witness to the city's German colonial past.

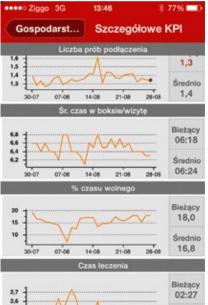*Southern Chile produces 70% of the country's milk, with a modern pasture-based dairy industry.*

VENUE

HOTEL PATAGÓNICO
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INTELIGENTNE POBIERANIE PRÓBEK LELY MQC-C
(SMART SAMPLING)

Nowy system kontroli jakości mleka Lely MQC-C (Smart Sampling) w robocie udojowym Lely Astronaut analizuje próby mleka co trzy doje u każdej krowy. W przypadku krów o podwyższonym poziomem LKS częstotliwość ta wzrosta i automatycznie analizowane jest mleko z każdego doju – na tak długo, jak jest to konieczne. Lely MQC-C (Smart Sampling) zapewnia stały monitoring każdej pojedynczej krowy oraz pozwala skupić uwagę hodowcy na krowach, które wymagają natychmiastowej uwagi co ułatwia w podjęciu decyzji odnośnie sposobu leczenia danej krowy.

Więcej informacji pod numerem telefonu 724 616 162 lub na stronie www.lely.com

UDOSKONALENIE.

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BENTLEY INSTRUMENTS
more than
30 years in BUSINESS
Founded in 1982

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European validation and certification organisation

Milk Total Flora

BactoCount IBC 50-150:

Rapid and accurate determination of raw milk Total Flora (cow, sheep, goat and buffalo) by flow cytometry

Optimize your productivity:

- From 50 to 150 samples/hour
- Fully automated
- Very easy to use and maintain
- Optimized connectivity and traceability
- Approved for milk payment
- Fully compliant with ISO/IDF standards requirements

Chemical Composition + Somatic Cells

Bentley Combi FTS:

Rapid and accurate determination of milk chemical composition (fat, protein, lactose, solids,+++) by FTIR spectroscopy, and somatic cells content by flow cytometry

- Highly reliable and accurate
- Up to 500 samples/hour
- Open system (spectral database/calibration)
- Optimized connectivity and traceability
- Enhanced samples identification (barcode/RFID)
- Extensive remote diagnostic capabilities
- Fully compliant with ISO/IDF standards requirements

OTHER BENTLEY PRODUCTS:

Bentley DairySpec FT:

The Bentley DairySpec FT is a versatile infrared analyzer for the rapid and accurate determination of milk and dairy product chemical composition. This instrument uses the latest in FTIR technology to deliver highly accurate dairy components analysis.

BactoCount IBCM:

The BactoCount Series provides real time determination of milk Total Flora and Somatic Cells content by flow cytometry.