Report of ICAR Working Group on Lactation Calculation Methods

Dr. Filippo Miglior
Agriculture and Agri-Food Canada
Canadian Dairy Network
Guelph, ON, Canada

ICAR Technical Session – Kuopio, Finland - June 3, 2004

ICAR Lactation Working Group

- Sander de Roos, The Netherlands
- Sophie Mattalia, France
- Zengting Liu, Germany
- Alessia Tondo, Italy
- Larry Schaeffer, Canada
- Paul Van Raden, United States
- Filippo Miglior, Canada
  Chair

Introduction

- The ICAR Lactation Working Group completed a survey in 2000 among ICAR member countries *(Miglior et al., 2000)*
  - assess daily yield and lactation calculation methods worldwide
- New guidelines on calculation of daily yield, when data collected with flexible recording or automated milking systems (AMS)
- Research projects carried out by lactation WG members
  - updated existing guidelines on milk recording
  - developed new guidelines for lactation calculation methods, alternate milk recording and milk recording in AMS herds
- Missing in the 2000 survey was information on milk recording in farms with electronic milk meters (EMM)

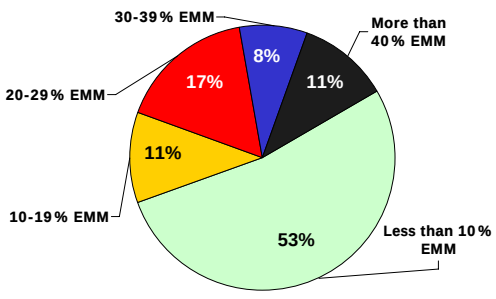
New Survey

- Electronic milk meters (EMM) more widely used than AMS
- No guidelines for milk recording in farms with EMM, especially for data updated directly from farm computers to DHI
- A new survey was prepared in order to obtain relevant information from ICAR members on milk recording with EMM
- Questions were also included on labeling and milk recording strategies, as requested by the ICAR Executive Board
- Survey distributed in January 2006 to 44 ICAR member organizations from 39 countries
- Thirty-six organizations from 30 countries replied, for a response rate of 82%

Survey results
Electronic milk meters (EMM)

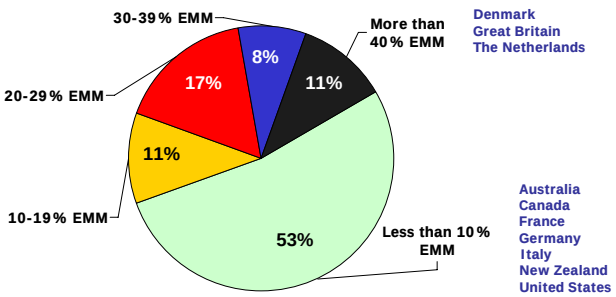
- Many farmers now have EMM, which record milk weights for every animal, every day, every milking
- Meters are linked to a PC which stores and processes data
- Processed data is then available to producers in real time to make appropriate management decisions
- Stored data can also be transferred electronically to DHI
  - further processing in order to provide data back to the farmer
  - input data for genetic evaluation units
- Easier now to access more milk weight data than was available previously with traditional milk recording 8 to 10 times per year

Distribution of ICAR members by presence of EMM* in client farms



**Electronic milk meters*

Distribution of ICAR members by presence of EMM* in client farms

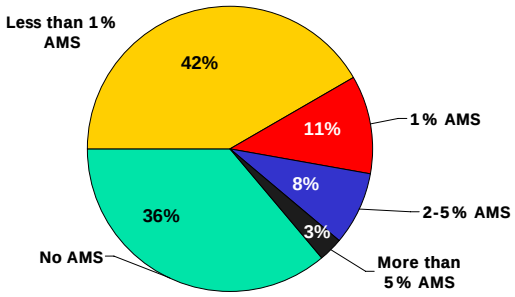


*Electronic milk meters

Other survey results
Electronic milk meters

- Close to 42% of countries upload data directly from some or all the farms with EMM to DHI data processing centers
- Answers from two questions regarding percentage of farms with EMM and direct uploading of data were cross-referenced
  - No clear pattern indicating that countries with high percentage of EMM farms tended also to upload data directly to DHI
- In EMM farms, most organizations (78%) used the last 24 hour milk weight at test day
  - The remaining countries (22%) use multiple-day averages of various lengths from 2 to 14 previous days

Distribution of ICAR members by presence of AMS* in client farms



*Automatic milking systems

Other survey results
Automatic milking systems

- Most organizations that have AMS farms (70%) calculate 24 hour milk yield, using all milkings in the last 24 hours
- Remaining organizations (30%) use multiple-day averages of various lengths from 2 to 7 previous days
- 61% of organizations use a 24-hour sampling period, and the remaining 39% use varying sampling periods (12 to 24 hours)
- For the calculation of fat and protein percentages
  - Most countries (70%) use all available samples per cow within the sampling period
  - The remaining organizations (30%) use only one sample per cow

Survey results
Labeling and milk recording strategies

- All countries except Canada and US use ICAR standard labeling for various types of milk recording
  - A, B and C represent supervised, unsupervised, and combination of supervised and unsupervised tests, respectively
  - 2, 4, 6, or 8 represent the number of weeks between tests
  - T is an additional label for alternate testing between morning and evening milkings (am/pm recording)

Survey results
Labeling and milk recording strategies

- France and Germany use additional labels due to increased flexibility of milk recordings offered to their customers
- France is adopting a new labeling system called CZ
  - milk weights are on both milkings (1 by the technician, the other by the farmer)
  - samples on 1 milking on an alternate basis (by the technician)
- Germany uses an extensive labeling system in addition to ICAR labels already in place (see report)

Labeling in Germany

	Milk recording schemes
S	Use all milkings collected using all milkings and sample collected on test day in proportion of milk yield from milkings
L	As above using all milkings and sample collected with equal amount of milk from each milking
M	As above using 1 milking and sample collected from alternating milking
N	As above using 1 milking and sample collected from the same milking with adjustment for milking time
T	Using 1 milking collected on using 1 milking and sample collected test day, but alternating from alternating milking
U	Using 1 milking collected on using 1 milking and sample collected test day, no alternating from the same milking with adjustment for milking time
E	Daily*, using all milkings and sample collected in proportion of milk yield from milkings
F	As above using all milkings and sample collected with equal amount of milk from each milking
G	As above using 1 milking and sample collected from alternating milking
H	As above using 1 milking and sample collected from the same milking with adjustment for milking time
	Milk test intervals
D	Daily
1-9	Every 1, 2, ..., 9 weeks
	Milking frequency
1-4	1, 2, 3 or 4 milking per day
R	Robotic milking

Survey results
Various

- Many organizations still do not use am/pm recordings (36%), while 61% use the standard 4 or 6 weeks interval
- 32% do not record start time of milking, even though 36% of this group use am/pm recording
- Most organizations (59%) calibrate milk meters every year, while 33% calibrate every two years (8% did not answer)
- Only 36% of organizations do not use unsupervised recording in their programs, while 31% of organizations use a combination of supervised and unsupervised recordings (C)
- The number of organizations that offer the most flexible milk recording (20%) has not changed since 2000

Survey results
Discussion

- An increasing number of farmers have invested in computerized electronic milking systems
  - record milk weights for every animal, every day, every milking
- In-line analysis technology may also be available soon at the farm level
  - information on fat, protein, SCC, lactose and MUN may be available on a daily basis for each cow in the herd
- DHI organizations may struggle to keep farms with such facilities as their members

Survey results
Discussion

- Farmers with EMM will be critical of any level of redundancy in data recording
  - may wonder why data, which is already on their computer, needs to be entered again by DHI personnel
- They may challenge the requirement to pay for DHI services when the data already sits in their farm PC
- Some large farms may consider discontinuing DHI services once they have installed EMM
  - EMM percentage outside of DHI may be large
- Several organizations already tackling this challenge
  - uploading automatically data from farms to their central systems

Survey results
Discussion

- Day to day variation of milk weights exists for each cow
- Many farmers believe that data stored in their computers (multiple day averages) more accurate than 24-hour weights collected monthly by DHI
- DHI need to increase efficiency in their service
  - Must be capable of offering value added service when data is processed and sent back to farmers, in order to help them in the daily management of their herds

Survey results
Milk recording strategies

- Most DHI organizations worldwide have not adapted to the changing needs of farmers
- Too many countries are still offering the standard 4-6 weeks, supervised milk recording
- Generally, those countries still receive public funding
  - They are not preparing for when the full cost may fall on the shoulders of the dairy industry and producers

Survey results
Milk recording strategies

- There may also be a perception that any type of flexible milk recordings brings inaccuracy to collected data
- The success of the dairy industry in those countries that have fully embraced flexible milk recordings should serve to confirm that flexibility
  - primarily benefits the heterogeneous pool of farmers
  - ultimately maintains or increases the membership base to DHI programs

Conclusions

- More and more farms invest in EMM or AMS facilities
  - Storage and automatic transmission of accurate data to DHI
- Many countries still do not offer convenience and flexibility of am/pm or unsupervised milk recording
  - Limiting the range of services (and prices) offered to DHI clients
- Each DHI organization should consider potential future benefits of increasing the flexibility of their milk recording services
- Finally, DHI worldwide should prepare for future challenges
  - such as reductions in public funding
  - use of in-line analysis at the farm level
- **These challenges will create a potential decrease in the DHI membership base**

Acknowledgements

- 36 organizations from 30 countries that took the time to answer the survey (and follow-up questions)

New Technologies
Afternoon 13:00-15:30

- Three invited speakers
  - T. Asmussen, Denmark (On-farm milk analysis)
  - J. Clay, USA (New Technologies at DHI)
  - D. Abernethy, Australia (New herd management tools)
- Open session
  - H. Soyeurt, Belgium (Fatty acids in milk samples)
  - E. Van't Land, The Netherlands (Web technologies)
  - P. Bredbacka, Finland (Mastitis DNA diagnostics)