Dedicated Analytical Solutions

A REVOLUTIONARY NEW TOOL FOR MASTITIS SCREENING

DHI Seminar TLRI, Taiwan 25 October 2015
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FACTS ABOUT MASTITIS

Inflammation of the mammary gland
Multifactorial disease (environment, keeping, feeding)
Worldwide, mastitis is associated with economic losses of $355 billion annually (Wenberg et al., 2002)
Mastitis diagnosis: somatic cell counts (SCC) and bacteriology are standard (Viguer et al., 2009)

Mastitis: inflammation of the mammary gland caused by bacteria or viruses, resulting in clinical signs such as redness, swelling, and pain.

Worldwide, mastitis is a major economic problem for the dairy industry. It is estimated that mastitis costs the global dairy industry around $355 billion annually (Wenberg et al., 2002).

Mastitis diagnosis typically involves the measurement of somatic cell counts (SCC) and bacteriological analysis. These methods are standard in most dairy farming practices (Viguer et al., 2009).

CELLS IN MILK

Microscope slide, milk sample

SCHEMATIC DIAGRAM OF AN IMMUNE REACTION IN THE MAMMARY GLAND

Lymphocytes
Polymorphonuclear neutrophils (PMNs)
Macrophages

According to Rivas et al., 2001; Paape et al., 2002; Schwarz et al., 2011a, b

CELLS IN MILK

Consist mainly of three populations:
1. Lymphocytes – initiation and regulation of the immune response, production of antibodies (Nickerson, 1989; Oviedo-Boyso et al., 2007)
2. Polymorphonuclear neutrophils (PMNs) – phagocytosis of bacteria at the beginning of an inflammation (Paape et al., 2002; Oviedo-Boyso et al., 2007)
3. Macrophages – regulation of immune response, phagocytosis of bacteria and cell debris (Sordillo and Nickerson, 1988)
RECENT INVESTIGATIONS

A. Type of milk sample
   - DSCC literature based on investigation of quarter foremilk samples
   - Relation between quarter foremilk and cow-composite (DHI sample)

B. Application of DSCC results in daily farm management
   - Identification of mastitis in its early stage
     - Information on time point of infection/treatment recommendation
     - Identification of potential bacterial infection (selection for further investigations)
   - Targeted selection of suspicious cows
   - Identification of mastitis in early stage
   - Information about probability of cure
   - Prudent use of antibiotics: treatment worthwhile vs. non-treatable chronic infection

FOSS has joint forces with the Veterinary Institute of Technical University of Denmark and SEGES

- The project:
  - 3-year duration
  - Detailed investigation of the udder health status of 1,000 cows in 5 modern dairy herds
  - Main objective: Investigation of new parameters for mastitis monitoring and development of guidelines for using these new parameters on dairy farms
A MESSAGE TO TAKE HOME

- Literature: SCC is an undisputed and well-established criterion, but DSCC is well-appropriated for more detailed characterization of udder health.
- Promising new applications enabling a better management of subclinical mastitis:
  - Identification of mastitis in its early stage
  - Identification of cows with bacterial infection
  - Information about probability of cure
- A lot of research necessary in order to develop the actual application of DSCC in the frame of regular DHI testing

For further information, please do not hesitate to contact: das@foss.dk

REFERENCES


