

## SECTION II-1 MASTITIS AND ITS COSTS

### 1. MASTITIS AND ITS COSTS

#### 1.1 WHAT IS MEANT BY THE TERM “MASTITIS”?

Mastitis means inflammation of the mammary gland and usually results in a change to the **anatomy** and / or **physiology** of the udder. Inflammation is most often the animal's response to a microorganism that is causing disease (e.g. bacteria, viruses) but may also be a response to injury or **systemic** illness. Inflammation can be seen because the udder will become red, swollen and painful – indications that the immune system is fighting a microorganism. Inflammatory cells are usually **white blood cells**, and when present in the milk, are called **somatic cells** (which may also include a small number of mammary tissue cells). Inflammation in the udder is most often measured by the level of somatic cells (somatic cell counts or SCC) present in the milk.

Fig. 1. Mastitic udder



“Intramammary infection” (IMI) is another term often used instead of the term mastitis but is limited to infectious causes only, i.e. those caused by a microorganism. For purposes of this course, we will use the term mastitis.

Mastitis causes a loss in milk production and the quality of the milk. It also affects the cheese-making quality. It can be detected by:

- Measuring the level of somatic cells present in the milk
- Clinical examination of the ewe, as well as
- Culturing the milk to identify the microorganisms responsible for the infection

Because mastitis is so important when trying to produce quality milk, this course will go into detail regarding the disease, how to detect it and how to treat and control it.

#### 1.2 WHAT IS THE IMPORTANCE OF MASTITIS IN DAIRY SHEEP?

When you see an inflamed udder or abnormal milk in a ewe, you can recognize that this means lost milk and therefore income. There are also losses, both milk and income, associated with high SCC milk (subclinical mastitis).

##### 1.2.1 ECONOMIC IMPACT

#### ESTIMATES OF THE ECONOMIC COST OF MASTITIS

To properly estimate the economic costs associated with mastitis, not only does a producer need to keep information on how much the disease is costing – but also determine what level of disease is

acceptable and attainable (i.e. set a goal). Mastitis cannot be eradicated like some other diseases (e.g. maedi visna) and so the control program must be designed to reduce losses so that a good **benefit – cost** ratio can be achieved. Economists call this “**avoidable loss**”, i.e. the difference between current losses and achievable losses given a good and affordable health management program.

Calculating the benefit – cost requires considering both the costs of having the disease versus not having the disease, i.e. changes to level of mastitis if specific interventions are taken, and the costs of lowering the incidence of mastitis. Below are examples of the costs (benefits) that go into this analysis.

### COSTS ASSOCIATED WITH NOT CONTROLLING MASTITIS

- A ewe with mastitis is frequently **culled** earlier in life than a ewe that has not had mastitis. This changes the **turnover rate** of the flock with lost opportunity sales of replacement stock and having to replace a ewe in the most productive time of her life with a ewe lamb that will have lower milk production. Mastitis has been attributed as the reason for removal in up to 35% of cull ewes.
- If a ewe is culled early, then the difference between her value and that of a ewe raised or purchased to replace her.
- The difference between the value of a dead ewe (if any) and a replacement ewe, including the cost of disposal of the dead ewe.
- A ewe with mastitis will have lower milk production in terms of yield, and total solids (fat and protein) multiplied by the value of that lost milk.
- Penalties levied for high SCC, lost bonuses for producing high quality milk, or rejection of milk from processors if mastitis levels rise too high.
- Lost lamb production in terms of mortality differences and poorer lamb growth (for flocks that raise the lambs on the ewe).
- Veterinary costs for treating clinical mastitis, which includes drugs, equipment and labour.
- The value of discarded milk from treatments, plus the risk of inhibitors (drug residues) being detected in the milk or meat.
- Increased feed costs associated with feeding less productive ewes.
- Increased management costs (labour and facilities) associated with separating treated ewes or ewes with contagious forms of mastitis.

Fig. 2. Cull ewes



### COSTS OF A FLOCK HEALTH PROGRAM DESIGNED TO CONTROL MASTITIS

- Improvements in housing (e.g. stocking density, ventilation).
- Improvements in milking equipment and its maintenance.
- Products to improve hygiene at milking (e.g. gloves, disinfectants, paper towels)
- Therapies such as “**dry-cow**” **intramammary antibiotics** that may cure existing infections and reduce new ones.
- Detection of and monitoring for subclinical mastitis (SCC and/or CMT and culturing milk from suspect cases).
- Costs associated with culling chronically infected ewes.

The difference between the costs of the disease + the cost of the interventions versus the financial improvements in the costs of disease from instituting the interventions is the benefit – cost ratio.

Mastitis is an illness that can cause permanent damage and sometimes death. It is also very painful to the ewe, particularly severe clinical mastitis. The welfare implications can also apply to offspring, as lambs nursing ewes with mastitis may starve to death. Mastitis must be properly treated and controlled to decrease the welfare costs to the farm.

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### 1.2.3 PUBLIC HEALTH RISK

Many of the bacteria that can infect the udder of a ewe can also cause disease in humans that consume the raw milk product. Often these disease agents cause mastitis but sometimes they are shed in the milk and no signs of disease in the ewe or its milk are apparent.

Specific bacteria that are risky will be covered in Section II.3. While most of these microorganisms can be killed by proper [pasteurization](#), raw milk cheeses or post-pasteurization contamination of milk products have been known to cause disease in humans.

Failure to withhold the milk after using [antimicrobial](#) drugs may leave residues of these drugs in the milk – increasing the risk of allergy or toxic insult in humans. Overtreatment with antimicrobials may increase the risk of [antimicrobial resistance](#). Residues from other drugs, e.g. [dewormers](#), lice treatments, hormones, painkillers, can all make humans ill.