DISEASE MONITORING AND EXTENSION SYSTEM FOR THE SOUTH AFRICAN DAIRY INDUSTRY

Disease Trend Report: July 2014

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This report was prepared by Dr Danie Odendaal of Veterinarian Network in support of the Disease Monitoring and Extension System for the South African dairy industry.

All information contained in this report is based on informal disease reporting and the herd veterinarian must be consulted before any specific disease prevention or treatment actions are taken, based on the information contained in this report.

This report is provided to dairy farmers in support of better herd health management with the understanding that neither the author/s nor the organisations involved accept any liability whatsoever with regard to any statement, fact or recommendation made in this report.

RuVASA
Ruminant Veterinary Association of South Africa
Herkouer Veterinêre Vereniging van Suid-Afrika

Service Providers and co-workers

A Milk SA Project
1. Preface

Importance of disease monitoring.

Time is the limiting and pivotal factor when dealing with the outcome of a disease. Correct timing therefore become the basis on which we build a preventative herd health approach.

All disease conditions follow a development process which can be as short as a few seconds (e.g. a cow that slips on a slick concrete floor and injures her hip) or as long as a few years (e.g. bovine leucosis that spreads and develops over a long time and then suddenly affects a few animals clinically).

Signs of disease are in many cases not easily visible during the incubation part of the disease development process, but once it becomes visible there is a very limited time period available to take action in order to prevent loss of production. (see an illustrated version of the disease development process of black quarter on the next page).

But there are so many diseases that can cause problems. To overcome this a disease monitoring system can identify the most important ones in order for us to visualise the critical periods where management action will be needed to prevent or take early treatment actions. (see page four for an example of such a visual overview of disease occurrence that can be used for management).

Diseases cannot only be managed as unpredictable emergencies.
Illustration of a disease development process that is so fast that it can only effectively be prevented by vaccination – black quarter as example.

Low grade infection
No signs of disease can be observed although the animal is already infected.

1-2 Days after bruising
Only lameness and swelling of the limb can be observed if very effective daily observation is practiced.

Next day
Sudden death of animals, mostly calves or young cattle but adult cattle can also die.

Post mortem examination
Veterinarian will look for typical signs of the disease in the muscles, under the skin and in other organs.

Bacterium

Toxin

Development of black quarter

The bacteria that cause black quarter get into the body through small wounds. These bacteria will migrate to the large muscles and will remain (resting) there without multiplying or causing damage. They will start to multiply only under favourable conditions.

When muscles get bruised it causes internal bleeding and the accumulation of “dead” blood which forms the right condition for the bacteria to start multiplying fast and produce a dangerous toxin in the muscles.

Poison that forms in the muscle which kill cattle
This poison is now taken up into the blood and circulated throughout the body. This poison causes immediate and severe damage to all the vital organs in the body including the kidneys, heart, lungs and brain.

The veterinarian will take samples to confirm the cause of the disease (diagnosis).

This part of the disease process is not easily visible

This part of the disease process is now easily visible
Example of how disease monitoring must be illustrated per region in order to identify high risk periods. This is needed for the correct timing of preventative actions as well as awareness for early disease treatments. It provides a annual and monthly overview of disease trends.

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Example of how disease monitoring must be illustrated per region in order to identify high risk periods. This is needed for the correct timing of preventative actions as well as awareness for early disease treatments. It provides a annual and monthly overview of disease trends.
As discussed previously, it is necessary that each dairy farmer has a written vaccination plan in place for the control of diseases that can effectively be prevented by vaccination. This must be developed with the help of the herd veterinarian, who will have a copy of the program in order to do collective seasonal planning for the ordering of vaccine.

The vaccines needed at a regional and national level for the dairy industry can be determined if each dairy farmer has a documented vaccination plan in place.

### 2. Vaccination plan

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The vaccination plan and budget for the amount needed per month, will differ for herds that calve on a seasonal basis (as illustrated above with only the basic vaccines entered as examples), versus a production system where cows calve throughout the year where the budgeting for vaccine is a little more complicated.
Practical starting point - as discussed in the previous report.

In practical terms dairy farmers can start right now with the first step, which is to determine the number of vaccine dosages that will be needed to vaccinate against the 3 insect transmittable viral diseases at the end of winter. These are vaccinations that are already done once a year by most dairy farmers.

This information is given through to the herd veterinarian who will combine the vaccine needs for his/her practice area.

The Veterinarian Network will obtain the number of dosages needed per veterinary practice and give a combined forecast through to vaccine producers.

If this simple combined action can be successfully executed on a national basis with the involvement of most dairy farmers and their herd veterinarians, we would have achieved the first step towards a herd health approach that can be expanded in the future.

**Action – Dairy farmer:** Compile a vaccination plan which indicates the type and amount of vaccine that will be needed over a twelve month period as per example provided.

**Action – Herd veterinarian:** Compile the vaccine needs per region that can be given through to the Veterinarian Network for determination of vaccine needs on a national basis.
A basic scale for the determination of the number of animals which show lameness, per management group, was provided in the previous report.

### Identify the problem
(Determine the rate and level of occurrence)

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<tr>
<th>Normal</th>
<th>Mildly Lame</th>
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- **Stands and walks normally with a level back. Makes long confident strides.**
- **Stands with flat back, but arches when walks. Gait is slightly abnormal.**
- **Stands and walks with an arched back and short strides with one or more legs. Slight sinking of dew-claws in limb opposite to the affected limb may be evident.**
- **Arched back standing and walking. Favouring one or more limbs but can still bear some weight on them. Sinking of dew-claws is evident in the limb opposite to the affected limb.**
- **Pronounced arched standing and walking. Reluctance to move, with almost complete weight transfer off the affected limb.**

The specific cause /s must be determined if 5% or more animals show moderate to severe lameness. There are many contributing factors but basically two main causes that must be distinguished for the sake of correct treatment or prevention.

- **Lameness caused primarily by infectious organisms.**
- **Lameness caused primarily by environmental conditions or other factors.**

The availability of a handling facility custom made for the easy lifting of legs, is a limiting factor on many dairy farms in connection with the examination and treatment of lame cattle.
Target for the examination of a lame animal:
One person is needed to get the animal into the handling facility and then to lift and secure the affected leg within one minute for the examination or treatment of the problem.

Go to the following webpage to see an excellent example of a well constructed handling facility:
www.lely.com › Home › Caring › Treatment box

In the next report the two basic causes of lameness will be discussed.
4. Disease trends

Blue ticks and resistant blue ticks.
In this report we will focus on the trend that high blue tick numbers occurred this year even during the first part of the winter. This is unusual and we can predict that there will be more first generation ticks at the start of the spring – see the distribution map below for June 2014.

Blue tick resistance can be underestimated.

The best time to test and evaluate the effectiveness of the different tick control groups, that will be used during the rest of the year, is during the spring.
Blue ticks – understanding the disease process that takes place on the animal

**Week 1**

**Start of infestation** -
The very small ticks (larvae) are not easy to see because they are as big as the head of a pin. The animal’s coat (hair) will still look smooth.

**Week 2**

The small ticks (nymphs) are still not easy to see because they are now as big as the head of a match. During a closer inspection nymphs can be seen in areas where the hair is short, as on the neck fold (dewlap) and backside of the upper back legs.

**Week 3**

Flat adult ticks are still not clearly visible. The first adult engorged blue tick females become visible three weeks after having climbed on the cattle as small ticks (larvae). Hereafter large numbers of newly engorged blue ticks will be seen on a daily basis until animals are treated.

**Inspection after treatment with a dipping compound.**

If the treatment was successful, no engorged female blue ticks should be visible one week after treatment.

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**Length of development** = three weeks (21 days) until engorged female blue ticks are visible

The tick larvae hatch from the eggs on the ground when the weather is hot enough. These larvae will climb onto grass leaves and seed heads and wait for cattle to brush past when grazing. They then climb onto the cattle and attach by making small holes in the skin with their mouths. Then they start sucking blood from the small blood vessels in the skin and grow.

After one week the larvae will molt (change their skin) to become nymphs, which will attach again, suck blood and grow further. It must be taken into account that new infestations with larvae will still take place, adding to the total number of ticks on the cattle.

After the second week, the nymphs will molt to become adult ticks, which will attach and feed. At this stage the females are still flat and they will find a male to mate with. After mating at the end of the third week, the female ticks will quickly suck blood and become engorged overnight. The next day they will detach, fall off and produce up to 2500 eggs.

**Effective treatment**

A dipping compound must kill all the ticks from very small to adult, present on the cattle at the time of treatment, and must further protect against new infestations for up to one week after treatment.

**This part of the disease process is not easily visible**

This part of the disease process is easily visible during weekly inspection of the cattle early in the morning.

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[Image of a cow with ticks on it]

[Image of an engorged female blue tick]

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Seasonal occurrence of blue ticks

The occurrence of blue ticks must always be understood in the context of a year (four seasons) that consist of a dry period and wet period. Blue ticks, as one-host ticks (short life cycle) can complete more than one life cycle (up to 3 life cycles as shown below) within the wet season. This can cause a massive build up of the tick population in one season in contrast with multi-host ticks.

Blue ticks on the cattle and in the environment

- **Winter**
  - Blue tick eggs survive through the winter to hatch during spring when they have been exposed to enough heat units.

- **Spring**
  - The first generation blue ticks infest cattle and complete this part of the life cycle (3 weeks) before they fall off to produce eggs.

- **Summer**
  - Next generation of blue ticks which can be 10X more than the first generation feed and produce even more eggs.

- **Autumn**
  - Blue tick population normally reach a maximum in the autumn and produce lots of eggs that can survive to the spring.

- **Next Winter**
  - When the heat units is too low the eggs don’t hatch. They survive until environmental conditions will be favourite again.

- **Determination of the effectiveness of tick control must be done when the first generation of ticks infest the animals.**

- **This means that the cattle must be treated and very closely inspected a week later for presence of any engorged female blue ticks.**

- **With the knowledge of the life cycle as illustrated on the previous page, it would be logical to understand that the cattle must be “clean” one week after an effective treatment.**

- **If there are engorged female ticks present the problem must be discussed with the herd veterinarian in order to make a decision on the use of a alternative dipping group or tick control method before the start of the summer and autumn.**
5. Call for Registration

We are continuing with the call for dairy farmers to register on the system in order to establish the dedicated and interactive communication channel between dairy farmers and their herd veterinarians.

The goal is to update the current distribution of diseases, creating awareness and basic understanding of the disease-development process of different diseases, in order to identify better disease prevention and/or treatment actions. The latter is always done in conjunction with the herd veterinarian.

A number of dairy farmers have registered after receiving the previous disease trend report. Registration after receiving the e-mails took a bit of time but everything is now in place for fast registration and participation on the system.

Dairy farmers that receive this report and want to register can send an e-mail with the following information to me at danie@v-data.co.za
1. Name and Surname.
2. Phone number / Cell phone number.
3. E-mail address
4. Where do you farm (closest town)?
5. Who is your herd veterinarian?

Dairy farmers can also contact their herd veterinarian directly to be registered on the system.

About 100 veterinarians are currently reporting on the system. Only 21 dairy farmers are fully registered and we would like to expand that in order to get at least some dairy farmers in each region to report to their veterinarians.
The location of 96 veterinary practices that reported during June 2014 (members of the Ruminant Veterinary Association of South Africa)

This is already a major step forward taken by the veterinarians themselves to enable them to be on the cutting edge of disease trends on a regional and national basis.
Monthly general disease reports and disease distribution maps as reported by the Ruminant Veterinary Association of South Africa. This represents the country wide occurrence of diseases as informally reported by veterinarians for all livestock species.

See the full report on the website of Milk SA by opening the following link (www.milksa.co.za/content/project-reports), which gives an overview of all the general disease trends for June 2014, as reported by the veterinarians.

There are also maps that give an indication of the distribution of the different diseases as reported during June 2014.

Dairy farmers are encouraged to discuss disease problems with their herd veterinarians, because the current disease report does not yet fully represent all the disease problems experienced by dairy farmers.
You are invited to look at the short video on the webpage of Milk SA that gives an overview of the need, and working, of the disease monitoring and extension system.