The image features the national flag of Uganda waving on a tall pole. The flag consists of six horizontal stripes of black, yellow, red, black, yellow, and red, with a white disc in the center containing a grey crane and a red-tipped staff. The background shows a palm tree on the left, a building with a balcony on the right, and large green leaves in the foreground. The text 'FOCUS ON UGANDA' is overlaid on the lower right portion of the image.

FOCUS ON
UGANDA

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Bottling in Uganda

by Fidelis Zvomuya

Dairy production in Uganda is a bucketful of paradoxes and problems, hope and heartbreak. In a bid to achieve a dynamic, regulated, profitable and sustainable dairy industry in Uganda, the Dairy Development Authority (DDA) came into being in June 2000, sired by parliamentary legislation empowering it to see to the development of dairy in Uganda.

The DDA's mission is to provide development and regulatory services that will ensure increased production and consumption of milk, sustainable and profitable dairy industry that will contribute to economic development and improve nutritional standards of all in Uganda, says Dr David Balikowa, the organisation's dairy development manager.

Dr Balikowa says the DDA's objectives are meant to provide proper coordination and efficient implementation of all policies designed to achieve and maintain self-sufficiency in the production of milk. But besides governing dairy legislation, they also register and license milk processors and traders, support the marketing of dairy products and advise government on milk standards.

The DDA has a ten-member board of directors constituted of representatives of dairy farms, cooperatives, processing companies, the Uganda Veterinary Association, dairy traders, MAAIF and the ministry of finance, planning and economic development.

hope





An outlet that sells milk in Uganda



Dr David Balikowa, Dairy Development Authority (DDA) dairy development manager



Uganda National Dairy Traders Association (UNDATA) executive secretary, Matovu Khalid

Improving efficiency

The production of milk in Uganda is largely done by subsistence farmers who are faced by inefficiencies and quality problems commonly associated with such systems. Therefore improvement of efficiency along the milk value chain, is also a major focus of the DDA.

“Economic improvement and consumer safety is what we wish for in this country, as we are now taking a regional look at marketing and exporting our products. The country produces more than 1,4 billion litres of milk annually of which 90% is produced from indigenous cattle, mainly the Ankole breed which is not a dairy animal,” he says.

Dairy production in Uganda is mainly pasture-based and with very few commercial farms. The dairy herds mostly produce an average of two litres per day. Generic breeds such as the Holstein-Friesian were introduced in the country, but most farmers who spoke to *Dairy Mail Africa* say they are still costly and more difficult to manage.

Due to market forces, milk production systems are intensifying, necessitating proper understanding of the new production tendencies. The sector has very few farmers who use the intensive systems which is dominated by pure breeds. They have invested in feeding, buildings and machinery within an extensive system which uses local breeds and requires minimal investment.

The country's total cost of milk production is dropping with increasing herd size, while dairy returns vary among farms from US\$18 to \$35 per 100 kg of milk. The dairy industry contributes about 50% of total output from the livestock sector and plays an important role as a source of food, income and employment.

National milk production

Dairy farming is concentrated in 42 districts found in the cattle corridor, which stretches from the south-western region through the

central to the north-east. On average 60% of the households in the cattle-producing region keep livestock.

National milk production has experienced a steady increase over the years, from an estimated 365 million in 1999 to the current 1,4 billion litres. The national herd size is about 7 million cattle of indigenous, exotic and crossbreeds.

In support of the DDA, the Uganda Private Sector Dairy Industry Development Activity, an initiative that was started by a consortium consisting of Land O'Lakes, World Wide Sires and Heifer Project International funded by USAid, was set up with the aim of increasing competitiveness and productivity within the dairy sector.

The activity focuses on market development, processing, marketing and distribution as well as milk bulking and handling, production and policy reform.

Weaknesses to address

Despite various initiatives to enhance quality at various stages of the dairy chain, many weaknesses still exist. The hygiene and handling practises at farm level are generally poor. The collection and transportation of warm milk and the sale of loose unprocessed milk, is still a big challenge as far as improving quality in the dairy chain is concerned.

Kutugo Dairy Farmers Cooperative Society chairperson, Robert Luyombya, says one of the key challenges to milk procurement and marketing may not be the generally poor milk collection, transportation and marketing infrastructure, but rather lack of harmony between the formal and informal marketing channels.

Luyombya calls for innovative ways to promote technology adoption in the smallholder dairy sector and also the development of viable farmer groups or promote linkages that would enhance vertical integration into dairy processing and marketing.

"The dairy retail market is largely dominated by milk traders who procure milk from us farmers. This has resulted in low variable farm gate milk prices caused mainly by abundant seasonal supply, long distances from markets in some areas," he says.

Fred Mike Maumbe of the Eastern Uganda Dairy Farmers and Breeders Association, says the country needs a radical shift from predominantly traditional subsistence dairy farming, to a commercially market-driven one. According to Maumbe, herd productivity is quite low with milk production of less than 10 litres per cow per day.

Lack of infrastructure

The other problem facing the marketing of milk in Uganda, is that the dominant informal sector lacks infrastructure for milk collection and transportation. Milk bulking is mostly done in open places without chilling facilities. Milk is transported in aluminium cans or plastic containers on bicycles used by more than 70% of the farmers.

Limited quality control is undertaken during milk reception. This leaves the evening milk uncollected and at times going bad.

Uganda has two major forms of marketing milk – the informal and formal. According to the executive secretary of the Uganda National Dairy Traders Association (UNDATA), Matovu Khalid says his association with a membership of more than 300 000 members who are selling more than 300 000 litres per day.

A litre of milk on the market costs 700 Ugandan shillings and they mostly buy their milk at a farm gate price of 200 shillings. Uganda has ten operational dairy processing plants and mini-dairies handling between 115 000 and 120 000 litres per day. The main product processed is pasteurised milk. Khalid says one of the biggest challenges remains low milk consumption. **DMA**



Pasteurisation increases quality

by Fidelis Zvomuya

In a move meant to improve the quality of raw milk for social, economic and health reasons, Tweyambe Dairies have set up a heat pasteurising plant in Kampala, Uganda, to render it free from bacteria.

Set up in 2003 and pasteurising about 300 litres per day, the number has since increased to 4 000 litres per day with milk coming mainly from the milk traders.

Tweyambe Dairies manager, John Rweuzigye, says the facilities were set up after the government banned the sale of unpasteurised milk. Rweuzigye says the pasteurisation of milk decreases the number of pathogenic organisms,

prevents transmission of pathogens and improves the safety of raw milk.

"We charge 530 Ugandan shillings for a litre and the process uses fire that will boil water to produce heat that will then warm the milk. We would love to embark on a proper commercial activity and put up a plant that will observe all the hygienic standards, but it is too expensive for us," he says.

Most of the traders in Uganda use such facilities before taking their milk to the market. Processing is slow, but the traders believe it to be effective. Uganda has more than 300 000 milk traders who trade more than 80% of all the milk consumed in Uganda on a daily basis.

Matovu Khalid, executive secretary of the Uganda National Dairy Traders Association, says this development helped save a number of his organisation's members who could not afford high prices for commercial pasteurisation.

"If it wasn't for such facilities, a lot of our members would have gone out of business," he says.

In his evaluation of milk quality in Uganda published in a paper in the *African Journal of Food Agriculture Nutrition and Development's* online version, Volume 7 No 5, Partric Grimaud wrote that small-scale heat processing enterprises were not viable, neither could they ensure or guarantee consumer safety nor offer a product of acceptable sensorial quality

Grimaud says small-scale pasteurisation of loose milk is meant to reduce the microbial load of raw milk to a minimum. However, there is great danger of post-processing contamination due to the fact that the heat-processed milk is not aseptically packaged.

"There is excessive heat application which causes physical chemical changes in the milk constituents, particularly the proteins.

"It is also believed that this alteration causes partial or total destruction of the natural lactoperoxidase system. This therefore implies that the heat processed milk will become an almost sterile substratum that is ideal for new colonisation by any contaminating micro-organisms, especially opportunistic bacteria like listera." Consequently, even if the microbial load of the heat processed milk was reduced to a minimum, several undesirable effects persist. For example, the treatment applied is so aggressive that the desirable compositional integrity of the milk is affected.

"There is a great chance of post-processing contamination and hence limiting the remaining



John Rweuzigye, Tweyambe Dairies manager, explaining how they pasteurise milk



The pasteurisation facilities pasteurise around 4 000 litres of milk per day

shelf life of the milk and probably consumer safety if contaminated with pathogenic micro-organisms. Moreover the change in organoleptic quality of the product resulting from physico chemical reactions occurs.

"These constraints partly account for the reasons why small-scale pasteurisation units have not been as successful as was expected when they were introduced and supported by the Ugandan Dairy Development Authority," the paper says. **DMA**



Selling unpasteurised milk
in Kampala Uganda

Sameer boosts capacity

Sameer Agricultural and Livestock Limited in Uganda has embarked on a US\$13 million rehabilitation project at its Kampala plant. It is set to increase its milk and dairy product production. The Sameer Group of Kenya in conjunction with the RJ Corp of India, established a joint venture company, Sameer Agriculture and Livestock (SALL) in Uganda in 2006 after signing an agreement to lease the assets of the Dairy Corporation Ltd from the government.

The project will include the construction of a new milk powder plant at a cost of US\$11.5 million. Sixty per cent of this amount has already been invested in the project, says the company's managing director, Anand Gaggar.

Gaggar says the eight-storey factory is expected to reach completion by December this year with the processing expected to start in January 2008: "This plant is expected to process over 200 000 litres of milk per day. We are going to fit it with modern milk processing equipment which will enable Sameer to process milk for the foreign market.

"By December we will be able to process about 350 000 litres per day, of which 200 000 will be for powder milk and 150 000 for the ultra heat treatment (UHT) and other liquid milk. We plan to produce between 350 000 and 400 000 litres of milk per day by the end of 2008," Gaggar says.

Soon after completion the plant will become the third-largest milk plant in Africa. This will see more than 200 000 litres being processed into powdered milk and 150 000 litres into processed milk.

The plant's current capacity is 120 000 litres per day, but its operation is running at between 65 000 and 78 000 litres of milk per day compared to the estimated 25 000 litres they were doing in 2006.

Smallholder empowerment

Currently Sameer, together with other processors, are processing around 80 000

litres of fresh pasteurised milk per day. In a bid to boost milk production and add value to milk from producers, Sameer has started empowering some of the smallholder farmers who are supplying them with milk.

So far the company has distributed 63 milk cooling tanks and generators to 63 milk collection centres in the south-western districts which include Mbarara, Bushenyi, Ntungamo, Kabarole and Rukungiri, says the managing director.

The coolers have a capacity of between 2 000 and 5 000 litres each, and Sameer keeps on managing the equipment as it provides technicians and engineers who check on them. "We are targeting more and expect the number to increase to 103 when we extend our support to six more districts.

"We are mainly focusing on the areas that we operate in. These districts have well-organised milk bulking groups which are being run by democratically elected representatives," he says.

Gaggar says they also train the farmers in animal husbandry, feed production, hygiene and quality milk production.

Seasonal decreases

During the rain season Sameer gets between 70 000 and 80 000 litres of milk per day, which drops to between 50 000 and 60 000 litres per day during the dry season.

"The completion of this plant will see us expanding our milk collection networks. Currently we are getting our milk from about 15 000 farmers and we are set to increase by 35 000 to 50 000. We are also going to expand our transport network to collect milk from all over the country," he says.

The company has 12 milk trucks and vehicles that will be increased to 30 tanks, each with the capacity to transport 15 000 litres.

"The powder milk plant will boost our company's capacity to take up the farmers'

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Despite the ban milk is still sold unpasteurised in Uganda

surplus milk which is not the case today, because we don't have enough outlets. On the cards also is the boosting of our domestic and regional market. Our market is currently limited to the East African countries, but with powdered milk we shall go as far as Nigeria, which is one of the largest consumers of dairy products in Africa," he says.

Export ability

Recently the company started exporting its milk to Southern Sudan, Kenya, Tanzania, Rwanda and Democratic Republic of Congo. It is exporting about 10% of its produce and expects to increase it to 60% when the plant is finished.

"Uganda is strategically positioned within the Comesa region and has a combination of rich soils and a favourable climatic condition. These are the most important factors in any country's ability to produce high quality milk," Gaggar says.

Milk production in Uganda is estimated at more than 1,2 billion litres per year. Smallholder farmers account for about 90% of the production, with animal amounts ranging from one to 40. The country's national herd is estimated at 6,3 million cattle which are predominantly indigenous with about 5% crosses and exotic breeds.

Despite this high productivity, Uganda still has

a low *per capita* milk consumption estimated at 50 litres per person per year, compared to the FAO-recommended 200 litres annually. Gaggar says their biggest challenge is to improve the quality of raw milk.

"We have to interact with farmer's groups and cooperative societies which run the MCC. Also, the market for processed milk in Uganda is limited due to the flooding of unprocessed milk from Kampala.

"The market for unprocessed milk is far bigger than that of processed. The processed milk market is around 80 000 litres a day while unprocessed milk amounts to around 250 000 litres a day.

Creating awareness

"As a company we are creating awareness of dairy products through sales promotions, expanding our sales distribution as well as sensitising consumers," he says.

The company has also started a programme to expose schools to the advantages of consuming pasteurised milk over the raw one.

"We receive between 250 to 300 school visits monthly and we demonstrate to them the advantages of drinking processed milk and tell them the whole milk story, from the cow to the consumer," Gaggar says. **DMA**



Fred Mike Maumbe, chairperson of the Eastern Uganda Dairy Farmers' and Breeders' Association

Breeding in Uganda

The Eastern Uganda Dairy Farmers' and Breeders' Association was started with the vision of becoming the leading dairy producer in eastern Uganda, and to deliver efficient services to its smallholder dairy farmers in order to produce good quality milk and provide good quality dairy products to consumers.

According to Fred Mike Maumbe, the association's chairperson, they set up the project with the goal of promoting the formation of smallholder dairy farming groups that will market their products collectively.

"We are not only looking at our members. We also assist our fellow dairy farmer groups outside Mbale with the identification and exploitation of other market opportunities within their reach. This is meant to assist us as farmers in expanding our dairy farming business to other regions.

"We are looking at ways to establish price regulatory systems in the market within this region, which will then result in the setting up of an effective milk supply chain in eastern Uganda," he says.

The association was established in 1998 by a group of dairy farmers who wanted to provide dairy-related services to its members. It operates in all the eastern region districts, namely Bugiri, Tororo, Mbale, Pallisa, Kapchorwa, Bukwa, Bududa, Manafwa, Budaka, Kumi, Soroti, Katakwi, Sironko and Kaberamaido.

Mbale has 18 restaurants utilising a market size of 450 litres of milk per day. There are seven milk vendors with a collective market size of 700 litres per day. Other establishments such as universities utilise 200 litres, schools 105 litres and hospitals 600 litres. Milk retailing is estimated at 500 litres and mainly target public and private functions.

Mbale has a total milk demand of 2 255 litres per day which is clearly not being met at the moment. The town has a population of 81 000 people and the population growth is estimated to be 3,4% per year.

The association is made up of 40 farmer groups with a total 1 366 individual members. Its governing structure includes a general assembly which sets general policy, a regional board which sets operational policy district assemblies, and

district executive committees which implement general operational policies.

"In December 2004, Land O'Lakes signed a memorandum of understanding with Bugusege Women's Livestock Cooperative Society Ltd, to which milk cooling equipment handling 2 000 litres of milk, was handed. This equipment was installed on Kumi road in Mbale Municipality.

However, when the management of the cooperative started experiencing difficulties in managing the milk cooling equipment and on 19 January 2005, Land O'Lakes convened a meeting of dairy farmers in eastern Uganda to discuss modalities for improving the management of milk cooling equipment.

"It was this meeting that saw the formation of a business committee to spearhead effective management of milk cooling equipment. By end 2005 it was apparent that keeping the milk cooling equipment in safe custody, was not beneficial to members of the association. They initiated negotiations with the management of Land O'Lakes to transfer the management of milk cooling equipment to the association.

The association then put up a proposal to become the end-user of the milk cooling equipment, so that it would fall under its management for wholesale and retailing of milk from members within and near Mbale Municipality.

In June 2006 Kabconsult services entered into a contract with Land O'Lakes to prepare and develop a professional business plan in accordance with the objective of assisting the association to assess the viability of the proposed collective marketing concept and to develop guidelines for the successful implementation of collective marketing concept.

When they saw the willingness to supply milk to the cooling plant, it was agreed that the milk would be bought by the centre for UGshs 488,5 per litre.

"We agreed that the centre was to realise daily a revenue of UGshs 590 per litre. The cooling plant was projected to operate at 50% capacity in the first quarter and 75% capacity in the second quarter, reaching 100% capacity in the third quarter of the installation year," he says.

The association's strength is its membership, which is producing enough milk to supply the

cooling centre. Farmers pay an annual subscription to the association.

But despite these strengths, the association faces challenges that include lack of adequate skills, a low income base, dry cows with low productivity, individual marketing by members and poor milk quality. Eastern Uganda faces a high incidence of animal disease that includes inadequate pastures, high cost of inputs and medicines and inadequate pure breeding stock.

"In terms of opportunities, the support that we are getting from Land O'Lakes is exceptional. The country has good government dairy development programmes, the market is available and the growth in the country's hospitality industry is good."

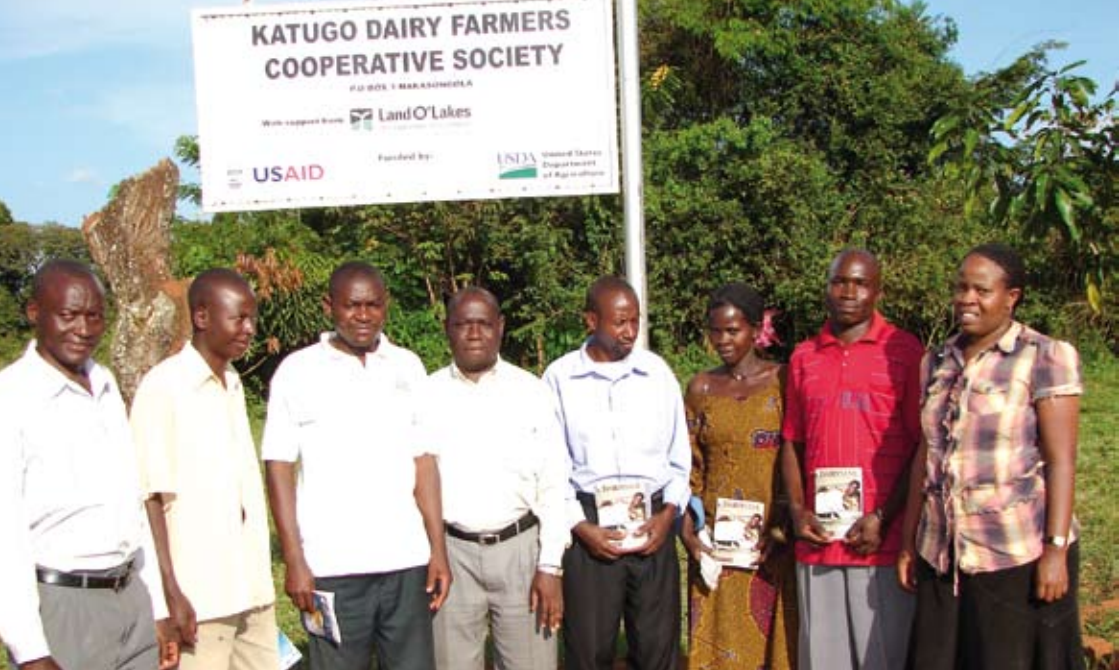
"Mbale has a total milk demand of 2 255 litres per day which is clearly not being met at the moment"

At the moment the cooling centre is getting its milk from the Bugusege Women's Livestock Society, Pallisa Farmer Group and Kapira Farmer Group who each supplies the centre with 500 litres per day. Hambana Farmer Group supplies 100 litres per day and Buhugu Farmer Group 300 litres per day.

In total the farmer member groups supply 1 900 litres per day. If these groups are mobilised and members remain loyal to the association, together with the establishment of an effective delivery and supply chain, the cooling plant will be able to receive enough milk to run at full capacity.

"We are aiming at the formation of a company that will be run by a chief executive officer. This company will educate farmers. The farmers will deliver milk to their nearest farmer group centre and designated farmer group officials will carry out quality testing.

"Our members have been receiving extension services from the private and public sector. This has enabled farmers to adopt new technologies and acquire some limited farm management skills. It is our hope that the company that we aim to set up, will provide this service to its members." **DMA**



Members of the Katugo Dairy Farmers' Association, a Land O'Lakes baby. From the left are Robert Luyombya, project chairperson, Jonathan Musonke, publicity secretary, Patrick Rwamasindi, former coordinator, Khalid Matovu, executive secretary of the Uganda National Dairy Traders Association, Gracious Ntwatwa, advisor, a female member of Katugo, and Ronald Sekitoleko, youth member, and Ruth Muwanga, Land 'O Lakes

Great dairy strides

by Fidelis Zvomuya

After years of depressed farm gate prices for milk, miserable dairy farmers and price-fixing by milk buyers, Ugandan milk has re-emerged as a local sourcing success story. Land O'Lakes has been implementing a private sector-based dairy development project since 1994.

The project is meant to provide technical assistance at all levels of the dairy value chain – from smallholder farmers to milk-bulking cooperatives and collection centres and value-added products like cheese and yogurt.

Land O'Lakes' presence in the country has helped the dairy industry to expand and become more efficient. It has increased the popularity of dairy products among consumers, and raised

income and profits for smallholder dairy farmers, rural enterprises and milk processors.

The organisation's acting country manager, Dr Paul Kimbugwe, says his organisation's staff, consultants and agribusiness experts offer advice on topics that include cooperative development, marketing, milk bulking and handling, value-adding processing, production, policy reform and industry organisation.

Dr Kimbugwe says their goal is to stimulate sustainable economic growth meant to alleviate rural poverty. Uganda's economy is largely agriculturally driven and two-thirds of the country's poor are smallholder farmers.

"So far we have increased the annual household income for participating farmers to about US\$349. Milk production has gone up by

28% and processing capacity utilisation is up 45%," he says.

Uganda's domestic consumption of processed dairy products now stands at 6,5 million litres. The milk entering the cold chain is now at 75 000 litres per day, which has resulted in an 89% increase in membership in producer organisations.

"Land O'Lakes' recent success story involves Maddo Dairies Ltd, a company that began operating a 1 200-litre micro-processing plant in the town of Masaka in 2003," Dr Kimbugwe says. Maddo buys milk from local farmer cooperatives and processes it into flavoured milk and yogurt.

Like many start-up enterprises, Maddo had good ideas but lacked the knowledge, systems and internal controls needed to effectively manage its operations. With the help of Land O'Lakes, Maddo's management turned the company around, instituting financial and other reforms that brought it from the brink of collapse to profitability by 2005. Within one year, the amount of milk purchased from area farmers increased from 74 800 to 208 580 litres, increasing their income from milk sales by more than 20%.

"Production efficiency at Maddo was improved with a cooling tower developed by Land O'Lakes' Sam Sebadduka, supervisor of milk quality and dairy processing in Uganda. Sebadduka developed a water-cooling tower that recycles water used in cooling the pasteurisation unit. Adoption of this simple technology cut water usage from 90 000 litres a month to 40 000, and reduced the share of water as a cost of production from 4,3% to 1%.

Uganda currently produces 1,2 billion litres of milk per year. Of that, 40% is consumed on the farm. Of the rest, about 20% enters the formal market in the form of processed and value-added products worth \$108 million. The remainder enters the informal market, where small-volume traders buy milk and sell it unprocessed to consumers, who then boil it at home. The value of the informal market is about \$160 million.

"Rural cooperatives play a central role in Uganda's dairy industry and much of the project's emphasis is in the area of cooperative development. The project advises on issues such as governance, membership responsibilities, the role of the board and legal registration,"



Land O'Lakes acting country manager in Uganda, Dr Paul Kimbugwe

the country manager says. Land O'Lakes also provides assistance in business management.

"Many groups, regardless of size, are weak in accounting and financial management, leaving them unable to track their funds and plan for the future. To address this problem, we introduced an accounting software programme to the cooperatives we are working with," Dr Kimbugwe says.

"This will help tremendously in getting the cooperatives we work with to the next level of financial management," said Abbey Ariong, the project's supervisor of cooperative and business development services. "Once our role of training in how to use the software on a day-to-day basis is done, we will then begin training them on analysis of the data."

Proper handling and milk safety are other major issues for cooperatives, many of which operate milk collection centres where members take their milk for bulking and chilling prior to pick-up by processors. The major centres have capacity in the range of 15 000 to 25 000 litres. The system is essentially a spoke-and-hub system, with smaller collection centres in the countryside feeding into the larger centres.

The milk is transported in 50-litre stainless steel cans delivered on everything from trucks to bicycles. Land O'Lakes provides assistance to the centres on the proper hygienic handling of the milk and training is given in standard milk testing procedures. **DMA**

Land O'Lakes

Most people know Land O'Lakes Inc as the producer of America's top butter brand, one of the country's leading farmer-owned cooperatives and a major player in agricultural supplies. But few are aware that the dairy giant has an international development division that has been helping farmers and rural businesses increase productivity in developing countries around the world for 25 years.

In the east African country of Uganda, Land O'Lakes has been implementing a private sector-based dairy development project since 1994. The project provides technical assistance at all levels of the dairy value chain – from smallholder farmers to milk-bulking cooperatives and collection centres to processors of milk and value-added products like cheese and yogurt.

Land O'Lakes' presence has helped Uganda's dairy industry expand and become more efficient, increasing the popularity of dairy products among consumers, and raising income and profits for smallholder dairy farmers and rural enterprises.

Working with various partners over the years, including World Wide Sires and Heifer Project International, the consortium has brought together expertise in various

interventions, which have helped develop the commercial sector capabilities to respond to productivity, processing and marketing issues faced by the entire dairy "farm-to-market" value chain.

Key interventions are:

- Market development
- Processing, marketing and distribution of value-added products
- Milk bulking and handling
- Production
- Industry organisation
- Policy reform.

Activities and achievements

Project staff based in Uganda and short-term consultants, many of them US farmers and agribusiness experts, offer advice on topics including cooperative development, marketing, milk bulking and handling. Funding for the Uganda project and other Land O'Lakes economic development initiatives overseas, comes primarily from USDA and the US Agency for International Development.

Much of the Uganda project's current funding came from the recent sale of 11 100 metric tons of donated American wheat on the local market under USDA's Food for Progress Programme.

Uganda

Stimulating sustainable economic growth to alleviate rural poverty is a major goal of the Uganda project. To date, the Uganda project has achieved results that include:

- \$349 average annual increase in household income for participating farmers (average per capita income is \$270 a year)
- 28% increase per day in milk production in participating animals
- 45% increase in processing capacity utilisation
- 6,5 million-litre increase in domestic consumption of processed dairy products
- 75 000-litre increase per day in milk entering the cold chain
- 89% increase in membership in producer organisations.

Because rural cooperatives play a central role in Uganda's dairy industry, much of the project's emphasis is in the area of cooperative development.

Training in standard milk testing procedures has been conducted to improve milk quality and ensure the product is safe for consumers.

The project also has played a major role in generic marketing for the dairy industry, which is not large enough to handle that function on its own.

Key partners/synergies

- Ministry of Agriculture, Animal Industries and Fisheries
- Dairy Development Authority
- Plan for Modernisation of Agriculture
- Uganda Export Promotion Board
- Uganda National Bureau of Standards
- Secretariat of the National Agricultural Advisory Services and National Agricultural Research Organisation
- USAID projects: Rural SPEED, SCOPE, RATES and PRIME West
- Health Partners.

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Prevention is better than cure

by Dr Pumzile Qwalela, Bayer Health Care

Disease forms an important part of livestock. Farming without understanding how it affects your farm can be disastrous. When your animals are healthy, they deliver better products.

Viral diseases are always difficult to cure, because they cannot be treated and their impact is huge.

The best way to prevent viral diseases is through immunisation or vaccination (the animal's body can form antibodies for a disease). The antibodies destroy the virus or bacteria that cause disease. The stronger the animal's immunity, the better chance it has to fight the disease.

“The best way to prevent viral diseases is through immunisation or vaccination (the animal's body can form antibodies for a disease). The antibodies destroy the virus or bacteria that cause disease”

The biggest problem is that farmers only react when the disease has hit their farms. By then it is too late. If his neighbours find out about the outbreak, they will vaccinate their animals and hope that their livestock does not catch the disease.

They will then forget about vaccination the following year. Their animals will then lose their immunity to that particular disease. This can

cause an outbreak on their farms, because the animals have a low immunity.

Vaccines work. The old saying of “prevention is better than cure,” has never been truer. This is the strongest weapon for immunisation.

To get the best results in the use of vaccines, you must remember the following:

- Use the correct vaccine
- Use the correct path of administration
- Maintain the cold chain
 - ▶ Do not use vaccines after their expiry date
 - ▶ Always work in a sterile environment
 - ▶ Vaccinate your animals at the correct age
 - ▶ Animals must be healthy and fit before they can be vaccinated.

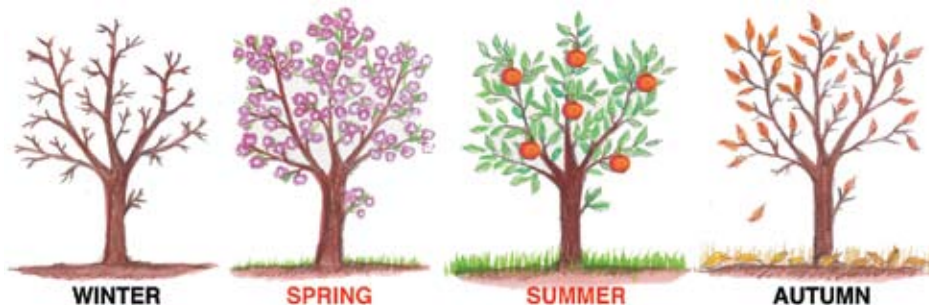
Some farmers think that they can save money by not buying vaccines. But the truth is that he can lose a lot more if he does not vaccinate his animals. If he compares the price of his prized bull or any other animals to that of a single dose of a vaccine, he will realise that what he pays for the vaccine is nothing.

Heavy rains increase the number of insects. A high number of insects increases insect-borne diseases. Livestock farmers should be careful of possible diseases in spring and summer. They must protect their animals through vaccination.

If people want to know more about the diseases, they must speak to their local veterinarian, who will give them guidance. **DMA**

Immunisation helps prevent viral diseases

Viral diseases are more common during spring and summer after heavy rainfall.



1

Why?

Healthy animals produce better

2

How?

- Follow an immunisation programme, use the correct vaccine

3

- Administer correctly

4

- Maintain the cold chain

5

- Do not use vaccines after their expiry date

6

- Vaccinate in a clean environment

7

- Vaccinate at the correct age

8

- Vaccinate only healthy animals



Discard expired vaccines

by Willie Botha, national sales manager, Onderstepoort Biological Products (OBP)

Farmers should not use vaccines past their expiry date, but rather destroy them. Expired vaccines do not work anymore. It is important to give the correct amount of the vaccine to the animal. This is so that the animal can build antibodies against the disease. Automatic syringes must therefore be correctly calibrated before use.

Farmers should pay strict attention to hygiene. Equipment such as syringes and needles must be properly cleaned before and after use. It is good to boil it in water for 10-15 minutes before use. Store vaccines at 4-8°C, as is shown on the packaging. If you do not store it at the right temperature, the vaccine will not work anymore.

When you buy a product, it should include a product leaflet that gives information on:

- How to use the product
- How to store the vaccine
- The side-effects the vaccine may have on the animal
- How much and the way you must give the vaccine to the animal.

It is very important to know which diseases may occur on your farm. This is so that you can plan your yearly vaccine programme for your herd. It is also important to know that you can only use the vaccine for the type of animal it has been made for. You cannot use a cow vaccine on a sheep, for example.

You must remember that vaccines should be used to prevent diseases. Vaccines will not help if your animal is already sick. It takes time for the animal's body to build up the antibodies against a disease. If the animal is already sick, the antibodies will not be strong enough to fight the disease, and the animal will stay sick, or even die.

Farmers often buy a vaccine, place it in the glove compartment of their bakkie, and then drive around in the sun for hours. If the vaccine is exposed to such heat, it will not work properly anymore, if at all. Vaccines should always be placed in a cooler bag with icepacks and immediately taken to the farm, where they should be refrigerated at the correct temperature. Liquid vaccines must never be frozen. Once a freeze-dried vaccine has been mixed with the liquid, they must be kept cool and given to the animal within an hour or two. Leftovers must not be stored for future use, but must be thrown away.

Farmers should only buy vaccines when they

“Farmers should pay strict attention to hygiene. Equipment such as syringes and needles must be properly cleaned before and after use”

are ready to use them. They should also buy the vaccines directly from their cooperatives, where the vaccines are kept in a refrigerator.

Some farmers decide what disease their animal have, without asking a vet. This might cause them to see the wrong disease, and vaccinate for the wrong disease. Farmers are advised to make use of their local veterinarian to give them the right advice and suggest the right product to use. **DMA**

Effective immunisation



Vaccines help to prevent disease.

Find out which diseases may occur on your farm to work out an immunisation programme.

1

Take care of the vaccine:

- Keep refrigerated
- Transport in a cooler bag with icepacks
- Do not expose to heat
- Do not freeze liquid vaccines
- Leftovers must be thrown away.



2

Read the instructions on the product leaflet for:

Correct dosage, method, storage (at 4-8°C) and side effects.

3

Remember!

- If the vaccine has expired, it will not work anymore and should be thrown away
- Clean the syringes and needles before and after use (boil 10-15 minutes).

Anthrax

by Dr Jacob Modumo, technical manager: Onderstepoort Biological Products Ltd

The floods we have experienced in the second half of this year will cause many diseases. Farmers must vaccinate against these diseases as soon as possible. Anthrax is one of these diseases. We believe that this disease will cause problems during autumn and winter.



What is anthrax?

The bacteria *Bacillus Anthracis* causes anthrax infection. Anthrax forms resistant spores. Animals then get the disease by eating on pastures or soil that contains these spores. The spores can stay in the soil for many years. The animal can get the disease up to 20 days after contact with these spores. This makes it more difficult to control this disease.

How is anthrax spread?

Anthrax infection in livestock often happens after a big climate change, such as heavy rains

after a long drought. Soil disruptions, such as crop farming, irrigation and floods can sometimes cause outbreaks. These disruptions bring spores to the surface. Livestock becomes infected when they are exposed to the spores or when they eat the spores. Anthrax can be carried over when animals from an infected farm are moved to other farms.

What can anthrax be confused with?

Farmers can confuse Anthrax infection with blackquarter. Both these diseases have the same symptoms. Anthrax and blackquarter also take place at the same time of year in the same regions. Symptoms of anthrax are fever, weakness, staggering, difficult breathing, lower milk production, blood in urine and milk, and death.

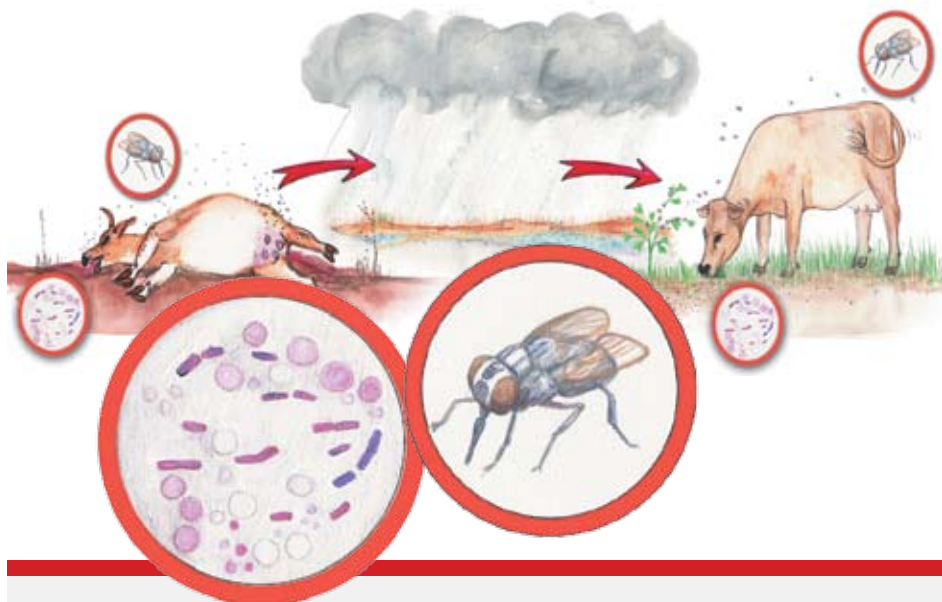
Blackquarter causes fever, weakness and swelling of the muscle groups that are affected.

Prevention is the best option

Anthrax is a big danger to our livestock. Farmers who do not regularly vaccinate their herds will have low herd immunity. This could be a disaster if the herd is exposed to the disease. Farmers must take care to manage disease control well.

Some farmers believe that anthrax has been destroyed and that there is no need to vaccinate. This is very risky. Vaccination is an economical and effective way to prevent and control most disease outbreaks. All farmers need to vaccinate regularly. **DMA**

Anthrax



Anthrax outbreaks often occur after heavy rains (after a drought) or when the soil is cultivated. Livestock becomes infected when they eat the bacteria spores.

Symptoms

1

- The animal becomes sick 20 days after infection. Symptoms are fever, weakness, staggering, difficulty in breathing, a drop in production of milk, urine and milk stained with blood. The animal can die.

2

- Prevent anthrax by vaccinating your livestock.

3

- Follow a vaccination programme.

4

- Do not move animals from an infected farm to other farms.

Protect against Tetanus

by Dr JH du Preez

Tetanus or lockjaw is a disease that affects almost all animals as well as humans. Horses and humans are the most sensitive victims of the disease, while cattle are less likely to become infected. Young lambs are also frequently affected. Almost all animals that contract tetanus, die.

The toxin of the bacterium that causes tetanus is very common in faeces, the soil of kraals and in stables. The bacteria can also multiply in the dead tissue of a wound, infecting it. The strong toxin is absorbed from the wound. It then moves along the nerve system to the brain and spinal cord, causing nervous symptoms such as muscle spasms.

The wounds left by castration and docking are the most common areas in which the bacteria multiply. The bacteria may also contaminate and infect the navel. The use of rubber bands for docking is particularly dangerous and must be avoided with lambs not protected against tetanus. These bands cause dead skin, which creates ideal conditions for the bacteria to multiply. Animal and financial losses can be caused through this procedure.

Typical nervous symptoms

- The animal lies down and has great difficulty standing
- It may become so stiff that it falls over and cannot get up again
- The legs are stiffly extended and the whole body is tense
- The neck is drawn back
- The jaw is closed tightly
- When such an animal is disturbed, it may go into an intensive spasm.

Inoculation

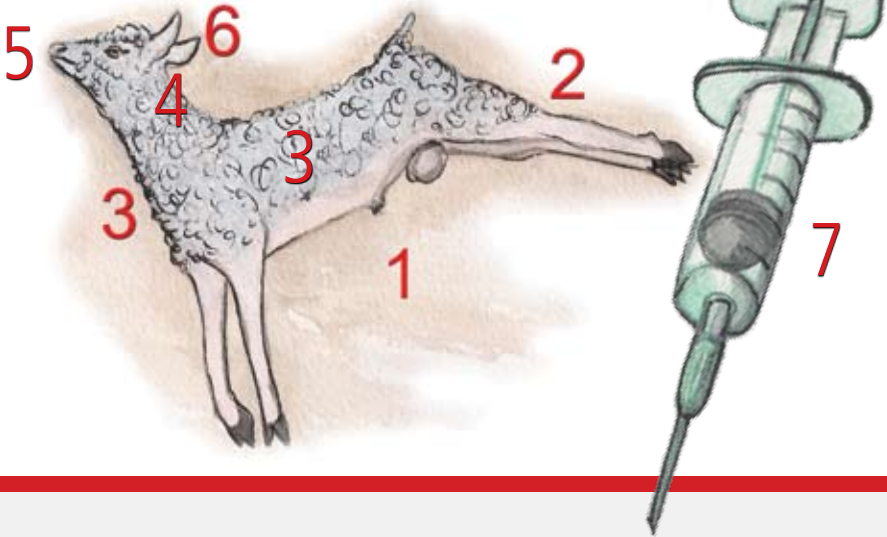
Tetanus is best controlled by vaccination. Animals vaccinated for the first time at the age of three months or older, should receive two inoculations at an interval of 4–6 weeks. Thereafter they are inoculated only once a year to maintain immunity.

“The use of rubber bands for docking is particularly dangerous and must be avoided with lambs not protected against tetanus”

To protect animals younger than three months during docking or castration and against possible navel infection after birth, the dam should be inoculated at six weeks and again at two weeks before giving birth. After that she needs to be inoculated once every year before the young are born. In this way the young obtain immunity which will protect them for approximately five weeks. At the age of three months they can be inoculated as described before.

Horses can easily contract tetanus. For that reason they need to be vaccinated every year. Other species, particularly sheep, should only be routinely vaccinated where the disease has become a problem on the farm. It is important to apply a high standard of hygiene principles during castration, tail-docking and other surgical procedures. **DMA**

Tetanus



Tetanus (lockjaw) affects the nervous system and most infected animals die. The bacteria are in faeces, soil of kraals and infected wounds from castration and tail docking.

Symptoms

1

- Lies down on its side

2

- Legs stiff and stretched out

3

- Whole body is tense

4

- Neck drawn backwards

5

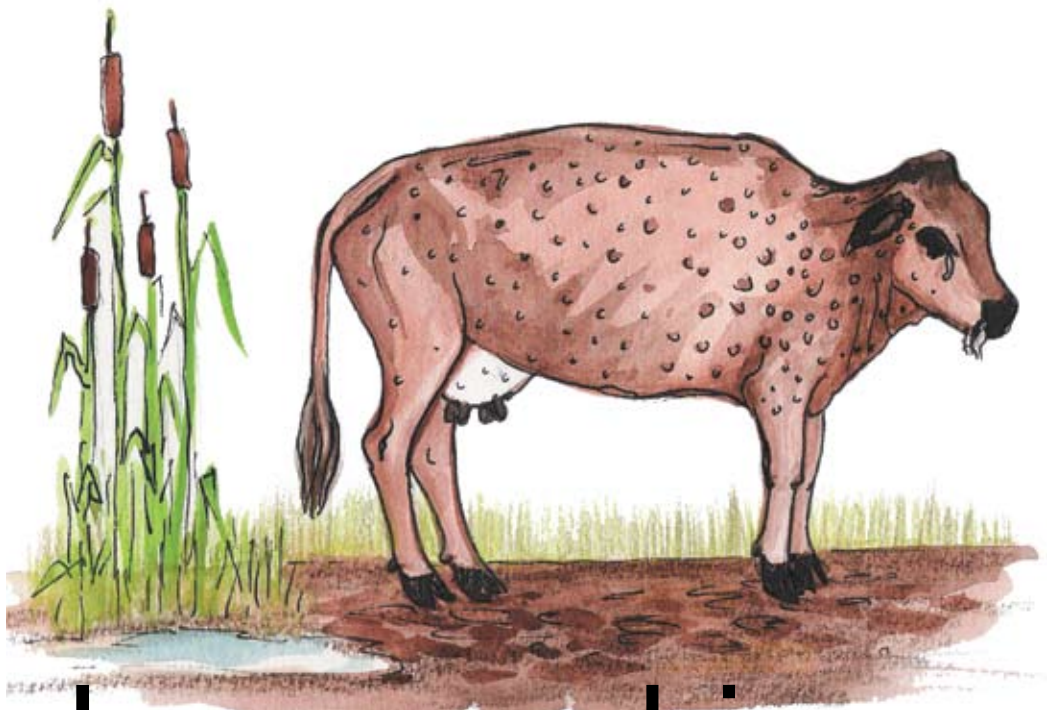
- Jaw closed tightly

6

- Reacts intensely to sound and touch

7

- **Prevention:** Vaccinate the mother before giving birth and baby animals at 3 months of age and two times at an interval of 4-6 weeks. Vaccinate animals every year.



Lumpy skin disease

by Dr JH du Preez

Lumpy skin disease is a serious disease caused by a virus. It may be prevented and controlled by vaccinating your cattle yearly. When cattle are infected with the disease, they develop a fever and one can see lumps in their skin. Little sores develop on the inside of the mouth, nose, and on the sexual organs.

In some cases the disease may spread fast and could affect the whole herd. The affected animals lose weight and their milk production drops drastically or stops. Pregnant cows abort and the skin is permanently damaged. Animals showing serious symptoms should be killed and buried because chances are good that they will never recover.

The virus is present in the saliva and skin lesions of the animals. When the animals are close together they rub up against each other and spread the disease. The disease can also be passed on to suckling calves through the milk. The disease usually spreads along roads and places where cattle often move.

Lumpy-skin disease is common in late summer and autumn, but there have been outbreaks reported during dry seasons too. The disease is quite common in animals grazing in low-lying, wet and muddy areas.

Symptoms

Animals may show symptoms such as a heavy discharge from the nose, heavy saliva dripping from the mouth and they do not want to eat. The animal's eyes become red and swollen. Lumps are found in the skin and in the muscles. There may be a few to several hundred lumps.

Sometimes the bumps turn into dead skin dropping from the animal, leaving raw abscesses full of pus. Soft, yellow-grey sores can be seen inside the mouth, nose and air passages, upper stomach and sexual organs. Sometimes a swelling under the skin on the legs is mistakenly regarded as snakebite and could be lumpy skin disease. Swelling of the legs can sometimes lead to lameness.

Usually one can see the lumps on the skin of an affected animal. In a laboratory a very powerful microscope, the electron microscope, is used to look at the samples taken of an affected area to confirm the presence of the virus.

Prevention and control

Because insects play a very important role in spreading the virus, methods such as quarantine or preventing cattle moving from one area to another are not very successful. However, sick

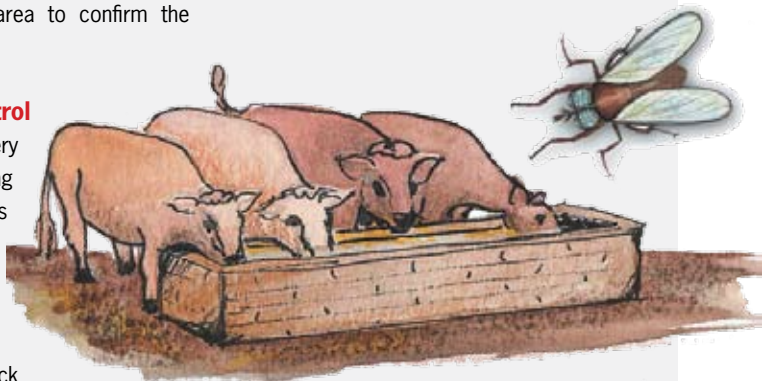
animals should be kept well apart from the rest of the herd and must not share drinking or feeding troughs. The virus also infects the semen of bulls.

Animals older than six months must be vaccinated against lumpy-skin disease during spring. It is safe to vaccinate pregnant cows. All animals must be vaccinated once a year. When vaccinating the animals during a disease-outbreak, it is important to use one needle per animal so that the virus is not spread from sick to healthy animals.

Make sure that the vaccine is not exposed to heat or direct sunlight as the ultra-violet rays will harm it.

Treatment

Ask your veterinarian for help. Treatment is done according to the symptoms of the disease. Be sure to take good care of your animals. Because the defence system of the animal is not strong, antibiotics should be given to prevent further infections. It is very important to control the disease. Vaccinating the animal before it becomes infected with the disease, will assist in curbing serious disease outbreaks. **DMA**



Anaplasmosis

by Dr Jan du Preez

Anaplasmosis is a very serious disease of cattle and is transmitted through the bites of male blue ticks. The disease can be controlled by regularly vaccinating your cattle. Anaplasmosis is also known as gallsickness.

Anaplasmosis occurs throughout the most parts of Southern Africa and Namibia, except in very low rainfall areas. Normally anaplasmosis is transmitted by at least five tick species namely the blue tick, the red-legged tick, the bont-legged tick, and other types. However, the male blue tick is regarded as the most important carrier of the infection.

When are animals infected?

Ticks pick up the infection when they feed on infected cattle or cattle that have recovered, but are still carriers of the parasite. Transport can also play a role when animals with the infection are moved to other areas.

The weather can also play a role. Outbreaks are more common in the warm summer and autumn months when large amounts of ticks are found. There is also an increase in blood-sucking flies in these seasons.

All cattle that have not been vaccinated, can contract the disease. However, all calves are born with a natural resistance to the disease. This natural resistance is strongest between 6 and 9 months. Anaplasmosis is much more serious in older animals. It may take between four to six weeks before an animal shows any sign of illness.

Symptoms of anaplasmosis

- A temperature increase
- Anaemia (the eyes and tongue are pale)

- Jaundice (the eyes are yellow)
- Slowed or stopped rumination
- Constipation
- Dairy cows may show a drop in milk production and this is often the very first sign of infection.

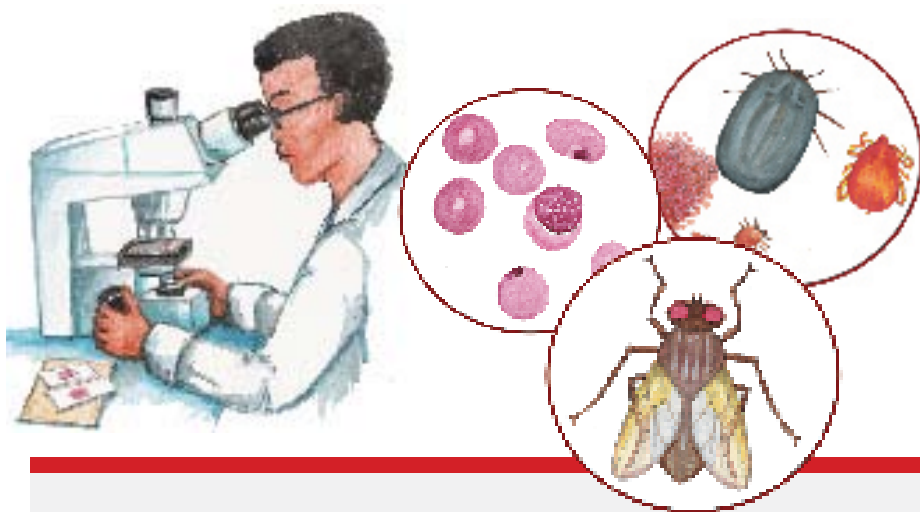
Treatment

A veterinarian will make a diagnosis by taking a blood smear. He will give the animal a treatment of antibiotics or cortisone. But you can do the following to help the sick animal:

- Do not move or transport the animal unnecessarily
- Give the animal good quality fresh water
- Give a mixture of sugar and vinegar or other stomach drugs to improve stomach function.



Anaplasmosis



Anaplasmosis

- The disease is spread when male ticks feed on an infected animal and then move to another animal. Sometimes blood-sucking stable flies and horse flies carry infected blood in their mouths.
- **When?** During the warmer summer and autumn months. When animals are moved to another area.

Symptoms

- 1 • Fever
- 2 • Anaemia (eyes and tongue are pale)
- 3 • Jaundice (eyes are yellow)
- 4 • Constipation
- 5 • Drop in milk production



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Brucellosis

Brucellosis is a very contagious disease and is caused by bacteria.



Cattle get brucellosis from **contaminated feed, water** and by licking the **infected afterbirth and calf**.

Symptoms

1

An infected cow may develop **large swellings on her knee joints** and **abort** at 7 months. Milk production will decrease.

2

Vaccinate heifers between 4-8 months with the S19 vaccine.

3

Always wear protective clothing when handling contaminated material.

Drink only pasteurised milk.

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Vision: The vision of DDA is to achieve a dynamic, regulated, profitable and sustainable dairy industry.

Mission: The mission of DDA is to provide development and regulatory services that will ensure increased production and consumption of milk, sustainable and profitable dairy industry sector that will contribute to economic development and improved nutritional standards in Uganda.

Objectives and functions: DDA's overall objective is to provide proper coordination and efficient implementation of all policies designed to achieve and maintain self-sufficiency in the production of milk in Uganda by promoting production and competition in the dairy industry and monitoring the market for milk and dairy products.



Ministry of Agriculture,
Animal Industry & Fisheries

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