

Zambia Dairy

produced by the

ZAMBIA DAIRY TRANSFORMATION PROGRAMME (ZDTP)

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'Master Farmers' to provide extension support to smallholder dairy farmers



ZDTP Field Extension Manager Kelvin Mulusa, right, discussing the Master Farmer model with Yvonne Chifwala in Choma, Southern Province.

Farmers gain a lot of knowledge and information from other farmers through peer-to-peer learning. With this in mind, the Zambia Dairy Transformation Programme (ZDTP) has introduced the 'Master Farmers' concept to aid knowledge transfer within the Zambian dairy industry. Master Farmers, or Lead Farmers, will function as facilitators between Extension Officers (EOs) and smallholder farmers in their communities. This approach recognises the limited number of farmers that formally-trained EOs can reach daily as well as the financial resources needed for fuel and transport. So far, more than 65 committed farmers from Central, Copperbelt and Southern Provinces have met the Master Farmers selection criteria, based on their dairy farming knowledge and experience, farmer entrepreneurship and people advisory skills. Master Farmers will work closely with EOs from the Ministry of Fisheries and Livestock (MFL) and dairy cooperatives to assist farmers in the rapid adoption of best practice dairy farming technologies and activities. They will do this by conducting training and demonstrations and using resources such as fact sheets and instructional videos provided by the ZDTP for distribution to their farming peers.

Income diversification prevents against economic shocks

Income diversification is important for dairy farmers to prevent against economic shocks within the dairy industry, whether they be climate related or financial (i.e., issues with cashflow). In practice, diversification means drawing an income from two or more sources rather than from just one job. A good example of this is how silage entrepreneurs in Liteta and Fisenge are now running chopper businesses using an operating cost business model developed by the ZDTP in conjunction with cooperative members. The chopper business model used by both Liteta Dairy Cooperative Union and Grafali Youth Group in Fisenge, as well as individual farmers in Fisenge, has also been successfully promoted to World Vision, which has purchased choppers for dairy cooperatives in Southern Province for integration into its own dairy programme (see page 2 for information on the business model).

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Chopper business model explained

The chopper business model assists would-be silage entrepreneurs to calculate cost-reflective prices. It also utilises cash-flow analysis to model selling forage chopper services to recoup the initial investment in the chopper. It is a 'living document', meaning it gets adjusted with time. Parameters can be adjusted to factor in price adjustment of various inputs, such as fuel or labour. Silage entrepreneurs from the Liteta Dairy Cooperative Union currently charge ZMW 80 per hour for chopper hire, to cover fuel costs, while the farmer using the chopper services provides manpower to operate the chopper.

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Grafali Youth Group, which was established in 2017 with the aim of bringing youth farmers together in Luanshya and boasts 36 members, was supported by the ZDTP to develop a forage chopper business using a chopper donated by the Dairy Association of Zambia (DAZ). After linking the group with farmers that needed a chopper, ZDTP Regional Extension Officer Wesley Chilambe coached members on the efficient running, repair and maintenance of the machine itself. Money generated from the chopper service has proved beneficial for income diversification – for example, some was used to invest in a village chicken 'pass on' programme and some was used to cultivate maize and soya beans. Grafali Youth Group treasurer Petronella Kasuba (pictured right) said the

youth farmers were grateful for Wesley's advice. She and other members of the Grafali Youth Group hoped that, in future, more key industry players would join forces to help donate, train and instil skills and knowledge the way the ZDTP had done.

To see an instructional video about how to operate a fodder chopper, visit <https://www.youtube.com/watch?v=nhJCeyhiU9I>.

Grafali Youth Group reflects on ZDTP support

Grafali Youth Group started working with the ZDTP in 2019, receiving coaching on governance, leadership, good record keeping practices (such as filing, minute taking and using a receipt book) and silage making. Grafali Youth Group treasurer Petronella Kasuba (pictured above right) said she and other members of the group had faced several common challenges, including being used as unpaid labour on farms in the past, which many felt was unfair. They currently had limited access to fertiliser, due to the cost and travel distance to purchase it. Climate change was another major challenge, Petronella said, with high temperatures leading rivers and streams to dry up, making it hard to find adequate water for their cows to drink. Despite these challenges, Petronella said the benefits of dairy farming were appreciated by the group. Youth farmers were happy to be earning their own incomes, as compared to previous situations where they gave free labour to their elders.



Grafali Youth Group founding member and treasurer Petronella Kasuba (above) owns a farm with her brother, Pearson Kasuba, in Fisenge. They inherited the farm from their parents, after it was passed on from their grandfather. With 27 hectares, the siblings grow maize, soya beans, beans, groundnuts and sweet potatoes and have six dairy cows between them. Petronella has been farming since 2009, when her father encouraged her to get into farming to support her young family. At first, she grew maize and groundnuts. In 2022, she got into dairy farming - something her family already had experience in. Pearson was working as a taxi driver in Luanshya; but quit in 2016, because he wanted to join his sister on the farm and have a steady source of income. In 2017, Petronella, Pearson and their peers started their own youth cooperative under the umbrella of the Fisenge Dairy Business Cooperative Union.

Cooperative extension pilot launches in three provinces

ZDTP has now launched trials of an extension services delivery model with three cooperatives committed to investing in a community Extension Officer (EO) in the long term. These pilots are being run in Liteta (Central Province), Mungaila (Southern Province) and Kwanshama (Copperbelt Province). The business model being trialled is based on the cooperatives recruiting and paying an EO from the community, who will then serve cooperative members with extension support. The return on investment is expected to materialise through increased milk volumes and improved milk quality. ZDTP will provide short-term, in-kind and financial support through the provision of a motorbike and fuel and maintenance costs for a period of two months. During this time the model must prove itself. The lessons learnt from the pilot will be documented and shared with other key stakeholders. The model integrates the services of identified Master Farmers who will play a complementary role to the community EO in terms of outreach to the wider farming community with the limited cooperative resources that are available.

Feed planning for optimal milk production on your dairy farm

Adult dairy cows need two basic things to thrive: fresh water and good quality forage or ‘roughage’. Both must be available at all times, day and night. Regular forage intake is important because it helps your cow’s digestive system work properly. Cows produce most milk during the first three months or 100 days after calving, so it is crucial that you make sure they are eating well during this time. As a farmer, you will benefit from spending time planning for your animal’s nutrition needs.

Fodder budgeting

We recommend that you make a ‘fodder budget’, which involves estimating the fodder needed for your animals per month over the coming months or year (see Table 1 below for guidance). You will need to consider things like the number of animals you have, the life stage/s they are at, calving dates and your ideal yield targets. With better planning, you will most likely reduce your overall feed costs – especially if you make your own feed such as silage! Overall, your animals will be better off. For optimal milk production, adult dairy cows need at least 20 to 30 kilograms of fresh forage or green silage per day. It’s important to note that milk production varies for different breeds. For example, a Jersey cow can produce 20-plus litres per day during the first three months. A local breed animal may only be able to produce a maximum of six litres per day.

Table 1: Pasture guide for Zambian dairy farmers.

| Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov |
|-----------------|-----|---|-----|-----|-----|-----|---|-----|-----|-----|-----|
| Natural pasture | | Supplement natural pastures (now low feeding value) with green crops such as Napier, maize or sorghum. Silage could also be used if in store from last years’ production. | | | | | Silage (or hay) produced during the wet season will now be the only available fodder on farm for dairy cows as the natural pastures now are of no nutritious value. | | | | |
| 60 days | | 150 days | | | | | 150 days | | | | |

Concentrates

On top of their fodder requirements, high-yielding cows such as Jersey cows should be given concentrates or dairy meal comprising 19 per cent crude protein during the wet season and 21 per cent during the dry season for the first 100 days after calving. The higher percentage in the dry season is due to reduced protein content in the pastures and other forages at that time of year. We recommend 2kgs of concentrate or dairy meal per animal per day in the first two weeks and 8kgs thereafter – that’s 4kgs in the morning and 4kgs at night. Concentrate feeding is not as important after 100 days, as the peak yield has ended. Between 100 days and 200 days, if milk production is still good, feed your animals 4kgs of maize bran per day. If milk production is not good, continue with the concentrates instead (4kgs per day, 2kgs in the morning and 2kgs at night). Maize bran has a lower protein content and is cheaper. For more information on feed planning for optimal milk production, see zambiadairy.com/fact-sheets.

Did you know?

Our website is home to more than 40 fact sheets featuring practical dairy farming advice - and they're free!

They cover:

- Business management
- Feeding
- Animal health, husbandry and management
- Milk practices, hygiene and quality
- Reproduction

Go to zambiadairy.com/fact-sheets to check them out now.

Keeping your calves warm and dry

Calves and heifers are your future milking animals. Keeping them warm and dry in a calf pen means they can use their energy to grow strong and healthy instead of using it to keep warm. It also means you can monitor how much they are eating and drinking. Your calf pen should be clean, dry and protected from weather elements such as direct sunlight, rain and wind. Position the entrance in a south-easterly aspect and install a rain or wind shield if required. Your calf pen should be well ventilated to allow air to circulate; this helps prevent pneumonia. It should be big enough for the animal to move around and have clean, comfortable bedding of good quality. Calves are social animals and can be housed in groups from the 4th week of life. It is good for them to be able to see or hear other calves / animals from their pen. Inspect your calf pens every day; if needed, remove urine and dung or put more bedding on top. A good test is to kneel on the floor for 30 seconds; your knees should be dry when you stand up. If you have any concerns about your calf's health, contact your local veterinary officer. For more information on looking after your calves, see zambiadairy.com/fact-sheets. To watch a video on this subject, visit <https://www.youtube.com/watch?v=xhhNFWjLL24>.



Tips for growing Napier grass



Napier grass (pictured left) is a useful feed for dairy animals in Zambia; it is fast growing, drought tolerant, perennial and can grow up to four metres tall. It is suitable as a 'cut and carry' feed in the wet season and at the start of the dry season. Ideally, Napier grass should be grown close to your kraal because this makes it easy to 'cut and carry' and to fertilise with manure from your dairy animals. We recommend planting Napier grass in individual basins because the basins capture water, which helps the plants grow. Basins should be 30 centimetres by 30cm wide and 15cm deep. Ensure 80cm between rows and 50cm between the plants in each row. Only take cuttings from healthy, mature Napier grass plants because you want new shoot and root systems to develop easily. Cuttings must have four nodes with buds intact. When cutting the material, cut the bottom of the plant at

an angle. Ensure you plant your Napier grass cuttings the right way up. Plant them on a slant to ensure two of the four nodes are buried into the soil to form roots and the other two are exposed to form shoots. Napier grass can be interplanted with Desmodium, lablab or velvet beans to increase protein content and make your animal feed more nutritious. In a good rain season, Napier grass will take two to three months to grow ready for the first harvest.

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As your plants grow, it is extremely important to control weeds because otherwise they will compete with your crop for nutrients. If you have access to water, you can irrigate Napier grass during the dry season to increase production. Harvest your Napier grass by cutting it at waist height (about 90cms) when it is succulent, palatable and easily digested by cattle. If left to grow over a metre, Napier grass becomes woody, can be difficult to chop and is hard for cows to digest. Cut your Napier grass at least 5cm above the ground to allow for regrowth and to minimise contamination with soil. Add cow dung to each clump of Napier grass left behind after harvesting – this helps boost the ‘shooting out’ of new growth. If fertilised and managed well, a good crop of Napier grass will provide at least three cuttings during the rainy season and an additional two cuttings after the rains have gone. The crop grows very well when fertilised with farmyard manure. When planting Napier grass, put two shovels of farmyard manure, or 40 grams of Compound D (equivalent to about four tablespoons), into each basin. Afterwards, at the start of each rain season, top-dress the plants with urea and water, to aid absorption into the soil, or apply one to two shovels of farmyard manure. Napier grass is best fed chopped into three-to-five-centimetre pieces. Use feeding troughs or racks when feeding your cows Napier grass to prevent contamination with mud, urine or dung and avoid feed wastage. A 400-kilogram dairy cow requires 30kgs per day of fresh Napier grass during the early dry season. For more information on growing Napier grass, see zambiadairy.com/fact-sheets.

PROGRAMME UPDATES

Instructional videos available on YouTube



Filming instructional videos.

We have so far completed four instructional videos featuring content relevant to smallholder dairy farming in Zambia. The material relates to calf housing, reducing feed wastage, using a fodder chopper and the importance of good calf care. All four videos are available at <https://www.youtube.com/@zambiadairy>. They are in English; however, we will be releasing Bemba and Nyanja versions down the track. Another four instructional videos are currently in production. They relate to feed planning for optimal milk production, growing Napier grass, mastitis prevention/treatment and climate-resilient agriculture practices such as ploughing and potholing.

Media outreach in collaboration with MFL



NAIS reporters conducting an interview.

We were pleased to host reporters from the National Agricultural Information Services (NAIS) in the Copperbelt and Central Province in January. NAIS is a specialised wing of the Ministry of Fisheries and Livestock (MFL) that disseminates agricultural information via printed media, television and radio channels. NAIS visited farms and documented new dairy farming practices that smallholder farmers have adopted, as well as the results they are seeing on their farms – and in their pockets. In addition to this, NAIS visited two different milk collection centres, in Liteta and Fisenge, gaining an insight into their operations, current projects and various challenges they face in their day-to-day work activities.

Livestock Development Act in the making

The Ministry of Fisheries and Livestock (MFL) is drafting the new Livestock Development Act (LDA) as a replacement of the repealed Dairy Industry Development Act. The LDA, once in effect, will regulate the entire livestock industry, including the dairy sector. The ZDTP is involved in providing technical support to the policy development process.



Zero-rating of imported milk equipment

The Government of the Republic of Zambia in its 2023 budget has extended a zero-rating for imported products to include the supply of milk cans, churns and milking machines. This measure aims to encourage the growth of the dairy sub-sector and promote the utilisation of appropriate milk-handling equipment, by making the equipment more affordable to dairy farmers and cooperatives.

DAZ-ZDTP collaboration in dissemination of best dairy practices

The Dairy Association of Zambia (DAZ) and the ZDTP will collaborate to deliver dairy extension services to farmers. In a meeting held at the DAZ Secretariat in October 2022, it was agreed that various models would be used to effectively disseminate technical information to dairy farmers aimed at increasing the productivity of milk. Among the tools to be used are an e-learning platform, distribution of fact sheets outlining best dairy practices, training modules and video programmes. It was agreed that DAZ would also engage the processors in this strategy as they also offered dairy extension services to the farmers (source: *The Dairy Magazine*, DAZ).

Help us spread the word



Zambia Dairy - Calf Housing
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Zambia Dairy - Reducing Feed Wastage
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Zambia Dairy - Using a Fodder Chopper
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Zambia Dairy videos on YouTube.

The ZDTP aims to support smallholder and emergent dairy farmers across all dairy farming areas in Zambia. Desired long-term outputs are improved income, increased availability of affordable milk, improved sustainable and resilient smallholder and emergent farmers (with reduced emissions intensity) and increased aggregate contribution to Zambia's economy by the dairy industry. Help us share knowledge and information relating to this cause by following 'Zambia Dairy' on Facebook (facebook.com/zambiadairy/), YouTube (<https://www.youtube.com/@zambiadairy>) and Twitter (@DairyZambia).