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Effective grain storage requirements

Grains are universal foods that provide calories, proteins, essential minerals and vitamins as food and feed. Degrading or loss of grade in quality and quantity from the field to the storing place is due to environmental factors (temperature, moisture content of grains, pH, humidity, type of storage structure used, length and purpose of storage, method of grain storage and biological factors (insects, pests, microorganisms, and rodents). Grain quality losses affect the nutrient and edibility of produce.

Hence, good storage management practices are significant for improved food and feed sufficiency.

Insects, microorganisms, and fungi can affect grain in the field or during drying, which makes it imperative for farmers to clean the grain before storing in a recommended facility that keeps the grain dry, at a uniform temperature and protecting it from insects and rodents.

The purpose of storage is to protect the quality of grains, prevent grain losses, ensure safety before marketing and consumption. Fungal attacks before or during drying can be disastrous, with effects persisting throughout the supply chain.

Post-harvest grain losses pose challenges to food, nutritional security, and public health. Storage varies with the length of time ranging from short-term storage on farm for drying to long-term storage for strategic reserves.

The storage structures and packaging materials are expected to extend the shelf life of the grains by making the micro-environment unfavorable for insect and microbial activities.

Farmers are urged to clean, disinfect, and fumigate the storage facility before use.

Grain can be stored in traditional and/or modern facilities depending on the amount of the grain.

For generations, farmers have been using traditional storage and packaging materials which can be highly efficient if utilized well. However, inefficient utilization can degrade the quality of the grains.

Some of the traditional storage facilities commonly used by farmers include cribs and mud structure granary (dura, tsapi and hozi).

In addition, grain may be stored in bags of various sizes and put in a storeroom.

Traditional pest repellent and preservation chemical dust can be used with these storage systems to further protect the grain.

Farmers can use fumigants BUT they should NOT be used for the in-house hozi or granaries. Modern storage and packaging materials recommended are the metal silo, jute bags, hermetic bags (treated bags which are reusable) and commercial warehouses.

The metal silos are not commonly used by farmers but are effective and have a higher grain holding capacity than self-build granaries.

Farmers are encouraged to dry the grain to safe moisture levels before storage.

The storage system protects the grain from weather elements, insects, pests, and mold when stored at safe moisture levels.

Fumigants and preservation chemicals can be used with these storage systems to further protect the grain.

However, to improve effectiveness of grain storage, there is need to clean and sort grain before preserving.

Farmers should ensure that there is no moisture in the grain, and the required moisture content has been reached.

Then, they can mix the grain with some traditional preservatives or chemicals to prevent early degradation.

Throughout the storage period, proper aeration of grains, regular inspection of grain stock, cleaning and fumigation of stored grains need to be performed.

Farmers need to check the grain every three months to see if there is pest re-infestation in order to apply corrective measures.

“The most important feature of grain storage systems is the ability to store grain for an extended period of time, preferably several months, with minimal loss in grain quantity and quality”. It should also ensure enough strength and durability to store grain effectively and efficiently for multiple years.

Additionally, the storage system design should be secure to prevent theft of grain.

Furthermore, farmers are advised to contact their nearest AGRITEX office for more information on grain storage management.

Compiled by Agritex
Produce the harvest

GRAIN storage losses can cost farmers between 25 and 30 percent of their yields for the season in most cases due to high moisture, pest damage, fungal/bacterial infections, and rodent damage.

In other words, it means out of a possible harvest of so bags, three bags can be lost due to poor post-harvest handling (cleaning, storage, delivery and distribution). In Zimbabwe, the general populace depends on stored grain for consumption, making it imperative to prudent to equip farmers with information on how best to handle their grain post-harvest.

Losses can generally be two-pronged, that is, in terms of quantities and consumer quality deterioration, which ultimately leads to economic losses. These can occur at any stage between harvesting and consumption.

The major causes of post-harvest losses include among other things mechanical damage, excessive exposure to high storage temperatures, relative humidity/moisture, contamination by fungi or bacteria, invasion by birds, rodents and pests.

The key to successful on-farm storage is to anticipate and prevent potential problems through good in-store management practices, a process which requires three basic steps/processes:

• sanitation,
• use of chemical protectants, and
• inspection.

Farmers should always note that stored grain may deteriorate if:

• ambient temperature of grain storage places is too high,
• the moisture of the grain is too high,
• the grain is diseased,
• insects multiply in the stored grain,
• rodents are allowed access to the grain,
• the grain is stored for a long time,
• this article gives an account of the guidelines for successful storage of grain:

• Only store dry grain and keep it dry (Damp grain or damp air will cause grain to rot). The ideal moisture content of grain for good storage is less than 13 percent.
• Grain may be dried naturally in the field while the plant, but losses from termites, deterioration, theft and weevils may accrue if crops are left too long in the field. Thus, it is better to harvest crops as soon as possible after maturity and dry the grain in the sun where there is good airflow over the grain. Alternatively, artificial drying may be used for large quantities of grain.

NB: Maize grain is prone to pest attack after reaching a moisture content level of below 13 percent, therefore, it is advisable to harvest as soon as the crop reaches this moisture level to avert pre-harvest (in field) losses due to pest damage.

Tip of the day: Important!

Rainy conditions, which have been characteristic of most last halves of the seasons in recent times have left most maize fields soggy (excessively wet and soft), which is likely to slow the dry down rate of maize and some other summer crops. Aeration blocks/gaps of four combine swathes (16-20 rows harvested by hand/machine) per sayha portions are recommended to improve aeration, which aids faster dry down. This will be imperative to aid early harvest and also timely planting of a winter crop (especially wheat) which we recommend to be optimally planted in the last weeks of April up to end of May for better yields and quality.

This is only applicable to a maize crop, which has reached physiological maturity (30 percent moisture level/black layer stage).

Never store grain that has already been attacked by insects, unless the insects have been destroyed. Damaged grain will allow the entrance of diseases and the insects may have laid eggs in the grain, which may re-infest the stored grain.

Never let rodents make their home in the grain store—keep rats out (Cats are an excellent way of controlling rats). Proper grain stor- age depends greatly on the storehouse. Build a good storehouse that keeps out thieves, rodents and moisture.

Before filling a grain store: Clean out thoroughly and fill in any cracks with mud or mortar. Spray surfaces, cracks and craves with pesticides to destroy pests and eggs. Paint the surfaces with goat or cattle manure and ash (burnt sunflower stalks or aloe leaves may be used.

Mix a grain protectant chemical (for example, Actellic Dust at 1kg per 1000kg grain: — there are other several options on the market) with the grain during filling.

Eucalyptus (gum tree) leaves can be mixed with maize grain to reduce storage grain pests. The smell chokes away storage pests. Alternatively, mix ash with the grain (3 to 10 kg ash per 100 kg grain). Burn a mixture of dry maize cobs, sunflower stalks and cow dung in order to produce the ash. Powdered (crushed) Syringa seeds also help to keep away insects.

• Small quantities of beans may be stored in a container with some sand. At frequent intervals (at least every two weeks) shake the container to mix the sand and the beans.
• Always use the oldest grain first. FIFO
We meet again at a time when most of you are busy marketing produce after a season that had most of the ingredients needed for a successful outing.

Of course, the rains might have abandoned your cause a bit too early in some cases to record 100 percent success stories but I trust you had crops that had made it to maturity then. Remember the new normal of doing business that requires you not to plant all your crops at one go?

Yes, if you remembered this when the season started and staggered your planting dates, then you should have some crops that escaped the last dry part of the season after the rains left prematurely without warning. Our summer seasons seem to have changed from starting in October and ending in March to beginning in December or early January and ending somewhere in April or May.

You will agree with me that in the not too distant past, rains would start in what used to be called the first half (October to December), which allowed you to plant all your season’s cropping options at that stage. The second and final half (January to March) would usually be marked by incessant but moderately heavy rains to see the crops maturing but that is no longer the case.

Our rains are longer evenly distributed throughout the season with cyclones and flooding becoming regular features that unfortunately seem to be bringing the entire season’s allocation of rains all at once and when they are gone, the chances of regular rains become very slim to impossible in most cases.

This should teach you to make sure both scenarios do not catch you off-side. There is no harm in trying an early crop that can either make it or fail depending on how the rains would have turned out. You can always have a piece of land on which you do winter ploughing to trap moisture and later try your early crop there. In most cases October is getting a once-off offering of rains, which your early crop can tap into as it waits for the eventual setting in of the season.

The rainfall patterns aside, let’s go back to the crop selling activities that are currently taking place. It is not a secret that you need the best prices for your produce and the best to achieve that is for you to produce free crops for which you have the liberty to fix prices and sell to buyers of your choice. This is possible if you make the best of the opportunities coming with the numerous support programmers from the Government and development partners meant to capacitate you to self-finance operations in the future.

You must not be a perennial dependent on those programmes. The idea is to give you a start so that you become self-reliant so shake off that mentality and start working hard.

Enjoy!!!

It’s a hype of activity across the country with harvesting of the earliest planted crops of maize, soya beans and others marking the order of the day. While some farmers are scouring to finish laying their land for the 2023 winter wheat crop, some are already planning for what have since finished planting.

It therefore goes without saying that the winter wheat season that has arrived brings with it a blank wait to be filled up by each farmer at the end of the season depending on the output.

In Zimbabwe wheat is the second most important cereal crop after maize. The annual wheat requirement for Zimbabwe is about 350 000 tonnes.

It is therefore every farmer’s duty to broaden the scale of wheat production and contribute to sustainable development goal (SDG) number one (No poverty) and SDG three (Zero hunger) by 2030.

Following the successful 2022 winter wheat season where Zimbabwe’s wheat production increased to 375 000 tonnes, every farmer should strive to GO FOR GROWTH this time around by increasing wheat production quantity and quality as the nation moves towards regaining its bread basket status, guided by the National Development Strategies (NDS1 and NDS2).

For any cropping venture to be successful it is important to START ON TIME.

The optimum planting dates for wheat are from the last week of April (in low veld areas) to the end of May.

However, the highest yields are obtained when establishment is done within the 1st 2 weeks of May.

Planting on time enables farmers to avoid frost conditions during critical growth stages of wheat like flowering, to avoid high disease and pest pressure during the months of August and September when the crop is in post-anthesis stage (grain filling).

Early planting also allows the tillering stage to coincide with low temperatures during the month of June.

Low temperatures and even frost at this stage, promotes tillering. Observing the planting window allows farmers to harvest their crop before the next cropping season.

One of the main advantages of planting on time is that farmers can harvest their crop before the onset of the rainy season.

Rain induces sprouting in wheat (Pre-harvest sprouting), thereby reducing the falling numbers which affect the baking quality.

Farmers should strive at all costs to establish their wheat seed during the recommended planting window. If the planting window is missed, the consequences can be dire.

The picture on the left shows wheat planted using a seed drill while the picture on the right shows wheat planted using a vicon spreader.

Wheat is a temperate crop grown pre-dominantly in winter in Zimbabwe.

The nature of Zimbabwe’s rainfall pattern means that wheat is established purely under irrigation.

For this reason, a farmer thinking of embarking on a wheat cropping venture needs to carefully assess and determine their irrigation capacity.

The total amount of water required to irrigate a wheat crop falls in the range of 450mm to 600mm from establishment right through to harvesting.

The irrigation equipment should be checked and serviced well in advance to avoid hiccups once wheat growing season starts.

Having ascertained this the next step is to service all equipment to be used during the establishment of crop. This therefore includes tractors, boom sprayer vicon spreaders or seed drills.

It is important to note that poorly serviced or calibrated farm machinery impacts negatively on operations resulting in poor germination, establishment and ultimately crop stand.

Irrigation infrastructure must be maintained to ensure there is no water leakages and blockages along the water delivery system.

With that in mind it is prudent to note that any successful venture starts at the planning stage. A well thought through plan is easy to implement. A good plan is indeed the key ingredient for successful establishment and management of the wheat crop. During the planning stage, farmers should bear in mind that yield is a function of two things yield per plant and yield per unit area. In the yield matrix there are a thousand reasons for low yields so much that naming them would be close to impossible, however there are only two reasons for high yields.

These are:
1) Good quality genetics/seed
2) Good Agronomic Practices (GAP’s)

Starting with the right seed variety suitable for a particular cropping region is key in increasing productivity. When selecting wheat varieties farmers should consider the following factors:
• Yield potential
• Crop stature (short stunted varieties are the best)
• Disease tolerance especially to leaf rust disease
• Tolerance to moisture stress
• End use quality, key for the milling and baking industry

They should select modern, innovative seed technologies that couple high...
Zimbabwe's Maize Market Set For Transformation With ZMX Platform

The Zimbabwe Mercantile Exchange (ZMX) has announced that it is ready to purchase maize from farmers this season. This move follows the Government's gazetting of Statutory Instrument 56 of 2023, which liberalised the sale of maize and officially recognised ZMX as a maize trading platform. ZMX is poised to play a pivotal role in facilitating transactions between sellers and customers as a result of this recognition.

The ZMX platform presents multiple advantages for farmers who opt to sell their maize through it. Firstly, it offers a transparent and equitable market where prices are determined by the forces of supply and demand. This means that farmers can secure a fair price for their maize without having to negotiate with intermediaries who may offer unfair prices. Secondly, the ZMX platform provides a hassle-free way for farmers to sell their maize. By simply registering on the platform, uploading their maize for sale, and waiting for offers from buyers, farmers can avoid the need to travel long distances to sell their produce, thereby saving time and money. Lastly, the ZMX platform guarantees a secure payment process for farmers. Payment is made directly to their bank accounts, which minimizes the risk of fraud or theft that may arise from cash transactions.

The ZMX platform is not only advantageous for maize farmers, but also for buyers who choose to purchase maize through it. The platform guarantees the quality of all maize sold on it by enforcing specific quality standards. This minimizes the risk of buyers acquiring low-quality maize that may not satisfy their requirements. Moreover, the platform expands buyers' choices by providing access to a broader pool of maize suppliers. This increased competition among suppliers allows buyers to compare prices and quality, enhancing their chances of obtaining the best value for their money. Consequently, this platform can potentially drive down prices and ensure that buyers obtain high-quality maize at a reasonable cost.

The ZMX platform presents an efficient and transparent means for buyers to purchase maize. Buyers can conveniently register on the platform, browse maize listings, and make offers on the maize they desire to buy. Upon reaching a deal, payment is transferred directly to the seller's bank account, ensuring a secure transaction for all parties involved. The ZMX platform offers a mutually beneficial solution for both maize farmers and buyers. Farmers can access a reliable and equitable market for their produce, while buyers can access a broader pool of suppliers and a transparent purchasing process. The platform's heightened efficiency and transparency can also boost economic growth in the agricultural sector, which is a vital component of Zimbabwe's economy.

For further information on accessing the platform, buyers can get in touch with ZMX and get a Participant Pack which they complete and they will be ready to go. ZMX can be reached on +263 775 188 102 for WhatsApp or call +263 24 2754842. You can also send enquiries to info@zmx.co.zw.

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Winter wheat planting – moving to ‘break the bread’

From Page 4

yielding capabilities. Wheat yields differ depending on altitude.

In Zimbabwe, white seeded wheat varieties are most commonly grown and have a high yield potential (5 – 10t) depending on altitude with highest yields recorded in the Highveld with altitudes greater than 1200 meters above sea level (masl) followed by the middle veld (800-1200masl) while lower yields are achieved at altitudes below 800 masl.

Modern wheat varieties are equipped with defensive agronomic traits like a short statured stem and good tolerance to periods of dry spells owing to irregular irrigation.

Short statured wheat varieties enable farmers to punch in high plant populations without the risk of lodging.

This results in an increased number of plants per unit area, resulting in an ultimate increase in yield.

The new block buster wheat varieties on the market include SC Select and SC Serena and the traditional workhorse SC: Neluna is still a favourite for most farmers especially when its susceptibility to leaf rust is addressed.

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Starting a small-scale dairy farm — the basics

Milk is your business

The main product from which money is made on a small dairy farm is milk. The norm in the industry is to penalise producers for poor quality milk and pay more for premium quality milk. Whatever market you target, aim to produce large quantities of safe, nutritious and wholesome product. Dairy is a low margin, large volume business.

When supplying a fluid market, whose main product lines are fresh, pasteurized or sterilised (UHT) milk, producing a larger milk yield and volume is important. The fluid market is by far the most important in Zimbabwe. When starting up in dairy, this is the market to target first. Specialised dairy product markets are more concerned with quality than volume and this is reflected in their producer price model. Such markets include processors turning the milk into specialised products such as powdered milk, condensed milk, cheese, yoghurt, ice cream, and butter. To supply such markets, a farmer needs to pay special attention to both milk quality and volume in the production operation.

Your dairy will also make extra money selling bull calves, cull cows, and heifers in excess of those required on the farm. Manure and slurry may be composted and used within the farm, or sold out to external customers. Slurry can also be turned into biogas to power the farm.

Milk quality is critical

Milk of poor quality may be rejected or penalised such that it gets a lower price per unit. Milk quality is of two types: compositional and hygienic quality. When we talk of compositional quality we refer to the nutritional content of the milk in terms of the density of butter fat, milk protein, whey proteins, lactose and dry matter that it has. This is the food value that the milk gives to the consumers. Milk compositional quality is a function of both animal and management factors on the farm. Animal factors include breed, age and type of cows. Management aspects such as cow and heifer rearing, handling, as well as nutrition and feeding, have large effects on milk quality and profitability.

Hygienic quality refers to the presence of pathogens, faeces, antibiotics and other dirty in the milk. This quality aspect is related to cow health management, animal welfare and milk handling on the farm. The most known measure of hygienic quality on a dairy is somatic cell counts (SCC), which is a measure of the cow’s immune response to diseases such as mastitis. Milk may be rejected or penalised for poor hygienic quality.

Which is the best breed?

Prospective dairy farmers always ask me this difficult question. Often-times I simply answer: ‘It depends.’ Depending on your circumstances, you may elect to use specialist dairy breeds (Holstein, Jersey, Guernsey, Ayrshire, Red Dane, etc.) or dual purpose ones (Brown Swiss, and Simmental). For those venturing into goat milk, consider breeds such as Saanen and Toggenburg.

Each of these breeds is unique in its qualities and attributes, both positive and negative. The type of breed to keep on your farm depends on the market and objectives of the business, production system, production conditions, market requirements, breed availability and farmer inclination, among other things.

Reproduction is critical

Unless a cow has a calf, she cannot produce milk. All your cows should calve down about every twelve to fourteen months without fail. Without reproduction, there won’t be any milk to sell. Another challenge of poor reproduction is that you keep many passengers on the farm, that need feeding without giving any milk to the business. You can mate your heifers and cows using a bull, or by artificial insemination (AI). AI is, however, the most common method of breeding dairy cows.

Feed is a big cost item and may determine whether you will make profit or loss. In a pasture based system, you take the animal to the feed. The cost of feeding the cows is lower as they graze on their own. However, milk yields are also lower and reproductive performance poorer on such farms.

Challenges with pasture feeding systems include seasonal growth as well as adequacy and quality of pasture. However, farmers tend to utilise a complex feeding program comprising grazing, conserved forages and concentrate feed.

In a feedlot or zero graze system feed is taken to the animal. A partial mixed ration (PMR) or total mixed ration (TMR) is given to animals housed in sedentary systems. With this system, feed supply is independent of season, precision feeding is possible and milk yields are higher. The only challenge is the high cost for running such a farm.

Feeding system

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AFTER a decade of using the skies as a play-ground, serving as a technician with the Air Force of Zimbabwe, then another 12 as an electrician with Phillips Electrical in Harare, Ephraim Pasipanodya decided to return to formal employment in 2006 to start seri-ous farming on his 32-hectare Combe Farm some 22 kilometres north of the small town of Banket.

He acquired the farm in 2003 under the Gov-ernment’s land reform programme and had been doing farming on a part-time basis given that he was always away at work. His serious romance with the land started with producing horticultural crops such as tomatoes and cabbages while he took on board maize and wheat for cereals. He was to quickly realise that market challenges were restricting his growth as an upcoming horticulturist because he was situated far from the markets for his products to compete effectively.

He was also producing tobacco alongside other conventional crops like wheat and maize but in small hectarages given that only 30 out of his 32 hectares are arable, which forced him to also consider the idea of seeking land to rent.

Pasipanodya was to make the bold decision of venturing into pig and layers farming – two activities that he believed would provide the launch pad for a serious and productive involve-ment with farming. To cut on production costs, he resolved to do his own feed formulations on the farm but working closely with livestock experts and agricultural extension officers in the area.

“The pig and layers projects uplifted me greatly. I decided to let my wife, Selina run the layers’ project with 1 000 birds each time while I concentrated on pigs. I started with just five pigs. Now I have a 50 sow herd that I maintain while trade involving other pig age groups such as the weaners and growers with boars included is constant. The piggery and the layers’ project gave us a constant flow of cash, which helped us fund other farming projects,” said the soft-spoken Pasipanodya.

A former rugby player during his high school days, which earned him a slightly rounded belly while walking, Pasipanodya believes his breakthrough in farming came in 2012 when he built a tunnel for tobacco curing, which enabled him to vastly improve his yields and earnings from the golden leaf.

“Where I used to get 20 tonnes of cured and ready-for-the-market tobacco, I started getting around 60 tonnes. I had managed to take of the problem of breakages that caused me huge post-harvest losses while the tunnel helped me use energy more efficiently.

“My earnings from the crop grew signifi-cantly, which allowed me to start procuring more implements on top of the few that I had,” said Pasipanodya recently when this news crew visited his farm.

The completion of the tunnel also made it possible for Pasipanodya to reduce his labour requirements for the tobacco curing process. He has 10 permanent employees and hires around 120 each time there is a lot of work to be done. But the benefits that came with the tunnel kept growing. He managed to buy his first centre pivot to boost his irrigation capacity after selling his tobacco crop. That year he had been con-tracted by Tian Ze and secured funding from the Commercial Bank of Zimbabwe (CBZ).

“Banks have been very helpful in my years of serious farming. They have been my sole funders and I am proud to say that every season they have been my savior,” Pasipanodya during the interview.

I have been able to repay my loans and secure fresh funding for the next season. The trick is to make sure you repay your loans and you will never run out funding. Banks want to work with farmers who repay loans to enable them to keep the loan facilities alive,” he added.

Pasipanodya believes consistency in planning is the tonic for success in every farming venture the farmer undertakes.

“Farmers need to come up with business models with which they can approach banks seeking funding. Sometimes banks appear to be denying farmers access to funding because some of the farmers do not have sound business models, which can easily serve as collateral once a bank is satisfied with the proposed roll out and repayment plan.

“In some cases you can use your own resources as collateral, which gives you the drive to do well so that you repay and avoid having property attached,” further explained Pasipanodya.

In spite of his slow beginnings, Pasipanodya now grows crops on more than 572 hectares of land, thanks to the Government’s decision to allow farmers with land they cannot fully utilise to enter joint venture arrangements with those that have the capacity. And he is adequately pre-pared to make the best use of the land.

He now has 35 centre pivots that can cover 550 hectares of land, 18 tractors that he procured either through funding from banks, Govern-ment equipment facilities or purchasing using proceeds from farming. Now his next biggest target is a combine harvester, whose procure-ment he believes will add more life to opera-tions.

For the 2022/23 cropping season, Pasipano- dyana had 150 hectares of wheat, 200 hectares of maize, 100 hectares of soya beans and 160 hec-tares of tobacco. He attributes his good showing to good plan-nning and close cooperation with his employ-ees whom he believes need to be treated with respect.

“As an employer you must never shout at employees. Work closely with the manager and allow workers to also talk to you in a relaxed and respectful atmosphere so that you can exchange ideas freely with them. When there is a job opportunity on the farm, do not start by look-ing outside.

“Allow your workers to fill it up from their ranks. You can only recruit an expert if there is no such expertise within your workforce,” he said.

Pasipanodya revealed that he holds a plan-ning meeting every morning with his workers during which they discuss activities of the day and how they should be done. It is also during such meetings that they discuss future activities once they would have been approved by man-age ment. He added that every farmer should keep records of everything that happens on the farm.

To secure the future of his empire, Pasipan-o dyana is grooming his three sons to be qualified agricultural economists and managers. He wants to retire at 65 and watch from the side lines as his boys run the show.

Consider seasonal milk production

Most Zimbabwean dairies operate an all-year production system. The mating program is planned so as to have 75-80% of cows in milk at any one time. However, the challenge of dry season feed availability is solved by a sound for-age plan that conserves excess fodder in summer for use in the winter and utilisation of irrigated winter pasture, if available. This makes dairying quite expensive.

Where dry-season feeding could be a chal-lenge, seasonal milk production may be a cheaper option for pastured based systems. In some countries (e.g., New Zealand and Aus-tralia) seasonal calving is very popular. Feed and forage availability and demand by the enterprise are matched, helping the farmer to reduce costs. However, seasonal calving is unable to take advantage of seasonal price increases.

From keeping airplanes in top swing to conquering the agrarian landscape

Starting a small scale dairy farm

Milking system

Investing in a good system to harvest the milk is as important as the cows, the pastures and the husbandry. Milking should stimulate maximum letdown of milk and ensure complete evacua-tion of milk from the udder. In addition, that cow and its udder must not be harmed and the milk-ing system should exclude dirty and pathogens from entering the milk.

A start-up dairy has a choice of milking by hand or by machine. Hand milking is slow (4-5 cows per hour), labour intensive, inefficient and compromises hygienic quality of the milk. With more cows, one may have to transition to machine milking which is faster, more efficient and cleaner.

Milking machines can be operated as fixed (in most cases) or mobile units. For mobile units, the bucket machine, trolley or bush dairy systems are common. Fixed units can have sev-eral arrangements, called parlour types. These include tandem, side by side, herringbone, rotary and robotic systems.

Conclusion

Dairy farms are so diverse, and deciding on the best structure is a complex decision that a start-up should make. It is advisable to start with simpler, cheaper systems and invest into com-plex systems as the business grows. Networking with established farmers and consulting the national dairy regulator is important.

About the author

Eddington Gororo is an animal scientist, researcher and academic. His long term career goal is to help farmers reduce yield gaps, and build sustainable and profitable agriculture enterprises through synergistic and context-specific technological applica-tions. Through his blog, Lets Farm ZW, he purports to build better, more productive and resilient livestock. He can be contacted on +263 77 391 6375 or gororoeddington@yahoo.com.
Traditional style

IN many farms, maize, sorghum and millet stovers are often left in the field and animals are let out to graze on them. Although the method is low cost, it results in losses of up to 50 percent of dry matter from trampling and spoilage. This method is more applicable in areas where stover is plentiful. In other cases, the stover is gathered into a heap and left in the field or under a tree, only to be collected when being fed to the animals. This method also results in heavy losses due to the effects of weather and decomposition.

Baling

Crop residues can be gathered and baled using a manual bale or motorised forage chopper. A chaff cutter using a motor can reduce manual labour for chop. It is easy to measure the quantity of chopped material. It reduces feed wastage. It decreases labour for chop. It offers the following advantages:

- Reduces manual labour for chop
- Reduces cost of purchase and maintenance of feeding equipment
- It is easy to measure the quantity to feed. On the other hand, baling involves higher capital expenditure in terms of labour (for cutting, gathering and compacting), equipment and construction of a storage facility.

Platform

A platform on the ground or raised and constructed using local materials may be used to protect crop residues from becoming mouldy and being attacked by ants. However, since the feed resource is exposed to rain and sun, it will quickly deteriorate in quality.

Benefits of storing fibrous feed residues for ruminant livestock — and human health.

- A roofed shed constructed using local material will protect crop residues from the effects of rain and sun, thus preserving the quality. Improvement of the shed can be done by replacing the grass thatched roof with corrugated iron sheets and putting a wall on the shed. While the iron sheets may protect forage against the rain, the cost may be beyond what most smallholder farmers can afford. It may also reduce insulation against too much heat during the day.

Storage in bags

Chopped residue can be stored in bags. It is advisable to place the bags under a shade or inside a roofed structure and off the floor to prevent the material at the bottom from becoming damp and rotting. Make sure the bag allows for air circulation so as to prevent mouldiness. Un-chopped crop residues can be difficult for animals to eat. Although chopped crop residues such as stover or straw to 5 cm or a little longer before feeding may not significantly affect the nutrient content, it offers the following advantages:

- It increases intake by the animals (leading to increased milk output).
- It reduces feed wastage.
- It makes it easy to mix with other feed components to make homemade rations.

Crop residues may be chopped using a manual chaff cutter or motorised forage chopper. A chaff cutter may be hand or motor driven. Motorised feed choppers can serve groups of farmers. A motorised feed chopper offers the following advantages:

- Reduces waste by promoting more efficient use of feed materials
- Reduces manual labour for chopping often assigned to women
- Minimises cost for purchasing feed by offering alternative local feed sources
- Encourages shift to zero-grazing based systems
- Saves labour in the production of mixed feed rations
- Cuts cost of purchase and maintenance by creating interest in farmers to get organised in groups to share forage choppers
- Leads to generation of employment opportunities for youths who assist farmers, particularly women, in transporting and operating the machines.

On the other hand, capital is required to purchase motorised feed choppers. There is also need for training in operation and maintenance of the equipment.

Soaking with or without salting

Chopped straw may be sprinkled with or soaked in plain water or a dilute salt or molasses solution before feeding. Farmers who have practiced it reported that it led to increased feed intake.

Urea treatment

Treating crop residues with 4 percent urea solution at 45–50 percent moisture improves the nutritive value by increasing the digestibility, palatability and crude protein content. Although the process is simple and farmers can easily practice it, care must be taken in order to avoid urea poisoning. Follow the procedures below:

a. Weigh 100 kg of material and spread on a polythene sheet or tarpaulin. Mix urea and water in a watering can. The ratio of urea to water for a 4 percent solution is 1000 grams of urea with 40,000 litres of water (4 percent), that is, 400 grammes urea should be mixed with 10 litres of water. (Urea readily dissolves in water).

b. Sprinkle the solution on the material on the ground, then mix thoroughly by hand or using a shovel.

c. Compact material firmly inside a polythene bag or plastic bag, preferably the thicker gauge (4.5 to 2 m in size, tied at lower end with sisal twine).

d. Repeat steps b, c, d and e until the polythene bag is filled up. Tie the polythene to ensure it is air-tight (4.5 to 2 m bag can hold about 150 to 200 kg feed material). After 21 days, the urea treated material is ready for feeding to the animals.

ZIMBABWE

The Ministry of Environment, Climate, Tourism and Hospitality Industry which has a mandate of developing, coordinating and monitoring the implementation of policies and programmes for Environment, Tourism, Climate and Meteorology that promote sustainable economic development requires the services of the following:

DUTY STATION: HEAD OFFICE/AVIATION STATIONS

QUALIFICATIONS & ATTRIBUTES FOR THE POST (in order of preference)

- Bachelor of Science Degree in applied physics/ mathematics/ statistics/ computer science
- Masters in Meteorology/ Agro-meteorology or any related field will be an added advantage

DUTIES AND RESPONSIBILITIES

1. Analyze and diagnose the weather situation as required in forecast and warning preparation.
2. Organize, update and issue warnings, observations and forecasts in accordance with National, WMO and ICAO standards.
3. Prepare and disseminate forecasts/warnings to designated users through approved means and channels to designated users.
4. Forecast weather parameters and evolving significant weather phenomena and validate current forecasts and warnings based on these parameters.
5. Forecast hazardous weather phenomena and disseminate promptly to relevant stakeholders.
6. Verify and validate meteorological data, products, forecasts and warnings (timeliness, completeness and accuracy).
7. Monitor the functioning of operational systems and take remedial actions when necessary.
8. Attend to all inquiries relating to weather conditions.
10. Any other duties as may be assigned by the superior from time to time.

Interested and qualified candidates should submit four (4) sets of their application letters, curriculum vitae and certified academic and professional qualifications by the 15th of June 2023 to:

The Secretary
Ministry of Environment, Climate, Tourism and Hospitality Industry
P. Bag CV7753, Causeway, Harare

Or Hand Deliver to
12th Floor, Kagivi Building, Causeway, Harare

Eligible Female Candidates are encouraged to apply as well as those who are able to speak and write fluently in a number of local languages will have an added advantage. Only shortlisted candidates will be responded to and salary range will only be disclosed to successful candidates.
Supplementation
Supplementing crop residues with fresh grasses, legumes or concentrates significantly improves feed intake and animal performance. Mixing with urea, molasses, yeast and salt provides both energy and nitrogen to the microorganisms in the rumen, improving the digestion of crop residues.

One mature dairy cow can be fed 10 kg of chopped wheat straw or maize stover mixed thoroughly with a mixture containing 2 kg molasses, 150 g urea, 10–15 g yeast and 200 g salt, all dissolved in three to five litres of water in a plastic bucket. The liquid mixture is normally sprinkled on the chopped material using a watering can and then thoroughly mixed.

Diet based on wheat straw or maize stover supplemented with urea and molasses or treated with urea only and supplemented with 2 kg dairy concentrate can support milk yield up to seven litres per cow per day.

Ration formulation
Rations formulated based on local feed resources have a huge potential to improve milk production on smallholder farms at a lower cost. The wide variety of locally available crop residues can enable the formulation of ‘best bet’ rations for farmers to choose from depending on what is available in their locality.

The choice of ration will usually be based on a cost benefit analysis, which takes into account:
• availability of ingredients locally
• cost of ingredients
• milk price

One or several crop residues may be included in a ration depending on availability.

Problems that may be experienced when feeding crop residues include:

Bloat
This is not common but may occur where crops have regrowth. Sorghums are known for this problem.

Mineral deficiency
When animals graze crops of the cabbage family (cabbage, cauliflower and kales) continuously for a long time, they may suffer iodine deficiency.

Symptoms include abortion and death of young animals.

Poisoning
Some crops such as potatoes tubers (unmarketable tubers after harvest), turn green when exposed to light and may cause poisoning. Feeding of potato leaves should also be limited.

Choking
Livestock can choke on tubers, maize cobs and other large pieces of food. Blockage of the oesophagus in ruminants, which happens when animals partly swallow solid pieces of food such as tubers of potatoes, carrots or maize cobs, results in severe bloat and death.

8 Steps to prevent problems

a. Always chop tubers of any crop (for example, potatoes, carrots and radish) before feeding to prevent choking or blockage of the oesophagus.
b. When you are not familiar with the feeding qualities of the crop residues, seek advice from your local agricultural extension officer or from literature.
c. Make effort to find out if the crop residue was exposed to moisture and look out for signs of fungal growth or test for fungal toxins.
d. Be aware of the potential danger of residues from crops that are usually sprayed with poisons for control of pests and diseases and follow the safe use of these products.
e. Always investigate poor animal performance to find out possible causes.

Compiled by Ben Lukuyu, David Ngunga and Mateete Bekunda
Guide to the goat breeding season

Why you need a breeding strategy

WITHOUT a smart breeding strategy, things can go horribly wrong. On the other hand, with a proper goat breeding strategy in place, you can reap the awesome benefits of a healthy, happy and more valuable herd of goats. Goat breeding is a subject you definitely need to understand if you are new to raising goats.

In this guide, we are going to cover 11 goat breeding questions that new goat owners ask about the most. Okay, let’s jump right into answering those common goat breeding questions and helping you get ready for your goat’s breeding season.

When to Breed Your Goats

1. What Breed of Goat is Best?

Proper goat breeding starts with picking the right goats. Beginning with the proper type of goats will save you lots of future headaches.

When choosing goats for breeding, your decisions will depend on what your purposes are for your herd.

The criteria you look for will be different if you are breeding dairy goats, versus breeding goats for meat, for fiber (Cashmere or Mohair), for pets or for other purposes.

General Rules for Selecting Ideal Goats for Breeding

Regardless of which breeds you select, there are certain general rules you will need to remember when breeding your goats.

When choosing a buck to breed with your does, look for one that has desirable characteristics you want in your herd.

The characteristics of the buck is more crucial than that of your does because your herd will be produced from many does, but many of those does will usually be bred by a single buck.

Therefore, it’s critical to make sure that buck has the kind of strong, desirable conformation that you want to see being developed in your entire goat herd.

Another rule related to this is, always breed to make your herd better.

In other words, use a buck that has more desirable characteristics and conformation than the goats you already have.

This applies whether you own the buck yourself, or you borrow a buck from another goat breeder as a stud goat.

When using a buck to breed your does, always make sure the buck is healthy and exhibits excellent conformation to the breed standards. As mentioned before, attempt to look at the buck’s mother and grandmother to check out their dairy qualities such as udder, teats, orifice size, etc. Finally, do not ignore colouring.

Attractive and desirable colouring is sought after by many buyers and recognised by many goat show judges.

Hopefully, you now have some valuable knowledge that will help you begin to learn how to confidently pick goats for your own breeding program.

Next, let’s look at how goat breeding works exactly.

2. How to Breed goats

As you learn about goat breeding, it’s important to first learn some of the basic terms that goat keepers use.

Goat Terminology

- Doe — A female goat
- Buck — A male goat
- Doeling — Female goat less than a year old
- Buckling — Male goat less than a year old
- Kids — Baby goats
- Wether — A castrated male goat

You may also hear people refer to a male goat as a “Billy” goat, and a female as a “Nanny” goat. Those terms can be used, but are considered slang. “Buck” and “Doe” are considered the technically correct terms. You will want to get familiar with goat breeding-related terminology as well.

- Estrous Cycle — The multi-stage reproductive cycle of a mammal
- Estrus — One stage of the estrous cycle, during which ovulation occurs
- Rut — Mating season for goats; when a buck is “in rut” he experiences an increase in testosterone and heightened sexual interest in female goats
- Freshening — occurs when a doe is pregnant, starts lactation and comes into milk; the first time she experiences this, she is referred to as a “First Fresher” or “FF”

Goat Breeding Style

Most goats breed easily when they are put together. It’s usually more of a challenge to keep them from breeding, than to get them started breeding.

When breeding goats, you will need very few bucks, and a larger number of does. In fact, many goat breeders may have only one buck, which breeds with dozens of does.

It’s logical if you think about it.

Breeding only takes a few seconds for the buck. But for the doe, it involves a few seconds of mating,

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1. The Grain Marketing Board (GMB) would like to warn the public from falling prey to conmen who are purported to be employees of the GMB.

2. The conmen purport to facilitate timeous payment of deliveries, purchase of products e.g. mealie meal and getting foreign currency.

3. However, once the conmen are paid in the given account they eventually disappear without any trace.

4. The public is hereby advised that GMB does not have any agents for procurement and payment of any product. We edge members of the public to report such incidents to the nearest GMB depot or any Zimbabwe Republic Police Station.

5. For further inquiries the public can contact GMB Corporate Communications Department through the hotline telephone line 0242-701898 or email at publicrelations@gmbdura.co.zw

Mr. C. GUTA
Acting Chief Executive Officer
Guide to the goat breeding

followed by many months of pregnancy, delivery, nursing and caring for her kids.

No wonder it takes a lot more does to get the job done. Some herd owners do not even own a buck.

They sometimes will borrow or lease someone else's buck just to breed him with their does as a "stud buck", and then they return him to the owner. Or a doe can be sent to someone else's farm to be bred and returned later. Just be careful if you do this and make sure you get proof that any other goats in contact with your goats have been tested to prove they are disease free.

DRIVEWAY BREEDING

Often, two herd owners will even agree to meet somewhere (like in a driveway) so they can let their buck and doe meet, breed and then leave a few minutes later and go their separate ways. Some people refer to this as “driveway breeding”.

Hand Breeding
Some people refer to “hand breeding” when they hold the doe with their hands so the buck can mount her.

Make sure your buck is getting plenty of good nutrition, especially if he is breeding with multiple does during breeding season.

How Many Does Per Buck?

Usually a young buck, about a year old, should only be allowed to breed with a group of 10 does max within the same month. Breeding can be exhausting on bucks and does because they are constantly awake, alert, excited and active at all times of day or night while they are in oestrus or rut.

Once a buck reaches two years of age, he can probably service up to 20 or 30 does. After age three, he can probably handle twice that many.

The main thing is to keep a close eye on your buck’s health and his nutrition during periods of breeding.

Because your buck will breed with so many does, his genes will have a huge impact on the future development of your herd.

That’s why so many goat breeders will spend the money to get a quality buck.

How Can You Tell When a Doe Has Been Bred?

It’s not always easy. One way is to look for a milky white liquid coming from her vagina after she’s been around a buck.

One tool that can help identify does that have been bred is a harness called a “breeding harness” or “marking harness”.

This is usually a nylon or leather harness that you strap around the chest of your buck.

It holds a big brightly-coloured rectangular crayon in the middle of the buck’s chest.

When he mounts a doe to breed her, the crayon leaves a coloured mark on her back.

Later, when you see this, you can know exactly, which does have been mounted by a particular buck. More on this later.

This can help you keep records of approximately when certain goats were bred, and which goats were involved.

This is important so you can calculate approximate kidding due dates on your calendar so you can be prepared.

We supplement our doe’s nutrition with additional supplements during breeding season, sometimes using a Drencher, also known as a Drench Syringe.

This squirts the supplements directly into her throat so she cannot spit them back out.

GOAT NUTRITION

During Breeding

Nutrition during goat breeding season is critical. For does, it’s been determined that a lack of proper nutrition can actually decrease a doe’s chances of becoming pregnant. A lack of Selenium and Vitamin E can also cause White Muscle Disease (Nutritional Muscular Dystrophy) in new kids.

Overall nutrition is important anyway, for both does in heat and bucks in rut, due to the extended, significant physical energy that goats burn up throughout the entire breeding season and process.

As usual, make sure your goats have plenty of quality forage, hay and grain. Consider adding minerals and vitamins, from sources such as black oil sunflower seeds (“BOSS”).

They’re a great source of extra Vitamin E, zinc, iron and selenium, which can add butterfat to your goats’ milk and make their coats shinier. You may want to limit these seeds for bucks, however.

There has been some evidence it can add to problems with urinary calculi in bucks. Goats can often suffer from a deficiency of Copper, Selenium and Vitamin E which can lead to serious health problems.

Sometimes this can occur when they are raised in pens and don’t get enough natural “browse” to eat.

So you will want to give your goats a supplement like “BoSe” which is a prescription Selenium/Vitamin E injection. Also consider giving your goats a “Copper Bolus” for extra copper.

This has to be inserted way down in the goat’s throat, so the goat can’t spit it back out or chew it. You may need to use a device called a “Bolus Gun” to make this process easier.

Plan the Timing of Your Kiddings

You will want to plan the timing of your goat’s kids. First, you have to be prepared to help, and so they won’t occur at a terrible time, such as during extremely cold weather.

To decide when to do your goat breeding, determine the ideal kidding time you want to aim at.

From there, count backwards on the calendar, 145 to 155 days (gestation period) to arrive at the approximate target breeding date. For many breeds the gestation period may be around 150 days. Of course, that’s approximate, and we have often had kids born many days earlier than that, as well as many days later in some cases.

You will want to plan the goat breeding so you don’t have too many kids being born around the same time.

We had about 10 kids born in the week or so before I’m writing this article, and we had several sleepless nights in a row helping our does deliver all of them in a short period of time.

It’s also tough when you add the time to wean, bottle feed and care for so many kids in such a short period. It may be better to control your goat breeding to stagger the anticipated kiddings at different times.

Of course, it depends on your personal preference. You may prefer to have kids born all at once to get it over with. Just be sure you have extra people around to help...to be continued.

Adapted from GoatFarmers.com
Introduction

• Nutrition is one of the constraints to livestock production, especially in the smallholder sector.
• Livestock require energy, protein, minerals, vitamins and water in order to live and perform the functions for which they are kept.
• The primary use to which those nutrients are put is survival and maintenance of normal body functions.
• The nutrients surplus to these requirements are used for production.

Factors affecting nutrient requirements of animals.

Age and size of animal

• As animals grow towards slaughter weight, more fat than muscle is deposited in the body and consequently the energy value of the gain is high.
• Young stock usually convert more feed efficiently than older stock.
• The maintenance requirements of a 400kg animal is higher than that of a 200kg one.

Type of animal / breeds

• Breeds differ basically in their voluntary feed intake per day, rather than efficiency of feed conversion.

Sex

• Heifers consume less feed per day than steers of the same size and breed.
• Female cattle deposit more fat than males during comparable feeding periods.

Physiological status of animal

• The physiological state of the animal will influence food intake according to the demand for energy.
• Growing animals offered high quality foods ad libitum will, after a period of underfeeding, gain weight faster than similar animals which have not been restricted.

Health status of animal

• Healthy animals will consume food as per their normal requirements.
• Depressed food intake is the most common symptom of ill health in animals.

Essential nutrients

There are five broad groups of essential nutrients

• Protein
• Energy
• Minerals
• Vitamins
• Water

These nutrients are required in different proportions and amounts, which must be borne in mind when balancing rations, designing supplements or planning a feeding programme.

Characteristics of feeds

Feeds for livestock are classified into roughage, concentrate and succulents.

Roughage

• These are feeds which include mature grazing, hays and crop residues, are cheap and often form the basal diet in beef and dairy enterprises.

Concentrates

• These are feeds which include cereal grains and oilseed cakes, are low in fibre and rich in readily digestible nutrients.
• They are used for pigs and poultry as well as cattle but are expensive feeds.
• Therefore, they are only fed to beef cattle as strategic supplements or in high-energy diets designed to achieve high growth rates.

Some sources of energy

<table>
<thead>
<tr>
<th>Cereal grains</th>
<th>Milling products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>Molasses</td>
</tr>
<tr>
<td>Sorghum</td>
<td>Masese</td>
</tr>
<tr>
<td>Millet</td>
<td>Bran, screenings</td>
</tr>
<tr>
<td>Wheat</td>
<td>Barley</td>
</tr>
</tbody>
</table>

Dry season beef cattle nutrition

Lease grazing cattle(left), Brown and Black Mashona cows

Lease grazing cattle
Roles of protein
- Formation of muscles, internal organs, bones and milk.
- Repair of worn or injured body tissues
- Growth
- Reproduction

Plant and animal sources.

Mineral and vitamin sources and requirements

Role of minerals.
- Take part in chemical reaction in the body.
- Assist in the prevention of diseases e.g. Goitre, degeneration of muscles (muscular dystrophy).
- Minerals do not provide energy for the body but are used for building up of bones and teeth (calcium and phosphate), body fluids (blood), and correct working of body activities and production of hair.

Maintenance requirements (minerals) (g/day)

Vitamins
- Vitamins are defined as organic compounds, which are required in small amounts for normal growth and maintenance of animal life.
- Vitamins are divided into two major groups namely fat-soluble and water-soluble.
- Normally, rangeland and pasture grazing provides adequate quantities of all fat soluble vitamins A, D, E and K.
- The main exception is in dormant or frosted winter grass, which is usually deficient in carotene.
- The B-complex vitamins are usually synthesised in adequate amounts in the rumen.

Vitamins of importance to animals, source, function and deficiency symptoms.

**Supplementary feeding**

Natural grazing drops in nutritional value during the dry season and is insufficient to meet dietary requirements and as a result, cattle condition declines. Supplementary feeding is therefore designed to correct the deficiency in the diet and prevents further decline in animal condition. Supplementary feed should also be given irrespective of season, to cows in production, calves and working cattle.

Supplementary feeding in communal areas depends on the type and quality of feeds available in the area and also on the requirements of the class of animal to be fed. Supplementary feeding will increase the output of a beef enterprise by increasing rates of reproduction, growth or milk production above the limitations imposed by the feeding value of the natural diet.

In winter, the crude protein content of dormant winter grass lies between 1 and 3% therefore there is a need for protein supplementation.

During times of feed shortages, milking cows and working oxen should be given priority for supplementary feeding followed by young cows. Feed animals once everyday preferably in the morning before they are let out to graze.

Animals survive on grazing stover in the fields during the dry months of winter. It can be treated with urea and molasses, which greatly increases the protein content, digestibility and palatability. Salt dissolved in water and sprayed on stover also improves palatability.

Levels of supplementary feeding
Feeding level depends on availability of grass, type of season, time of the year and feed cost.
Minimum daily levels of digestible protein needed in winter.

Maintenance requirements (minerals) (g/day)

<table>
<thead>
<tr>
<th>Species</th>
<th>Salt</th>
<th>Calcium</th>
<th>Phosphorous</th>
<th>Magnesium</th>
<th>Copper</th>
<th>Iron</th>
<th>Iodine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>50-150</td>
<td>5.0 – 6.0</td>
<td>3.5 – 4.0</td>
<td>1.0</td>
<td>2.0-12</td>
<td>3-40</td>
<td>0.15 – 0.5</td>
</tr>
<tr>
<td>Sheep</td>
<td>5.0 – 8.0</td>
<td>3.5 – 4.0</td>
<td>1.5 – 1.4</td>
<td>1-6</td>
<td>30</td>
<td>0.15 – 0.5</td>
<td></td>
</tr>
<tr>
<td>Goats</td>
<td>3.5</td>
<td>3.5</td>
<td>1.2 – 1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vitamins of importance to animals, source, function and deficiency symptoms.

<table>
<thead>
<tr>
<th>VITAMIN SOURCE</th>
<th>Function</th>
<th>Deficiency symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Maintain mucous membranes in health condition.</td>
<td>Eye blindness</td>
</tr>
<tr>
<td>D</td>
<td>Calcium and phosphorous metabolism</td>
<td>Rickets, Swollen knees and hocks in young cattle</td>
</tr>
<tr>
<td>E</td>
<td>Antioxidant</td>
<td>Muscular dystrophy</td>
</tr>
<tr>
<td>K</td>
<td>Promotes blood clotting</td>
<td>Anaemia</td>
</tr>
<tr>
<td>B1</td>
<td>Sodium transportation</td>
<td>Slowing of heart beat, lack of appetite</td>
</tr>
<tr>
<td>B2</td>
<td>Assimilation of nutrients</td>
<td>Decreased rate of growth, lowered feed efficiency</td>
</tr>
<tr>
<td>B6</td>
<td>Amino acid transformation</td>
<td>Convolusions in all animals</td>
</tr>
<tr>
<td>Br2</td>
<td>Metabolism of propionic acid</td>
<td>Decreased growth</td>
</tr>
<tr>
<td>C</td>
<td>Oxidation reduction in living cells</td>
<td>Weak bones, loosening of teeth</td>
</tr>
</tbody>
</table>

**CLASS**
- In-calf 283 year old cows
- Mature cows bearing 2nd calf
- Yearling heifers
- In-calf cows which were dry last season
- Weaners

**DIGESTIBLE PROTEIN**
- 250g
- 150-200g
- 200g
- 150g
- 100g

**Supplements**
- Roughage Sources: Crop residues such as maize stover, mhunga and sorghum stocks, millet staves and hay.
- Protein feeds: Legume residues are high in protein. These include cow pea, groundnuts stocks, velvet bean and jack bean. Soya bean meal, Cotton and ground nut cake.
- Energy: Cereal grains such as maize, sorghum, millets and beer residue.
- Minerals & Vitamins: Mineral & vitamin supplements added to animal feeds.
- Water: An animal requires 2-3% of body weight as water. On average mature cattle require 35 to 50 litres of water per day on a hot day. Aval clean water on ad libitum basis (without restriction).

**Lean season mitigation strategies**
- **Cattle disposal**
  - Some cattle can be sold before they lose too much weight. The remaining herd can then be grazed on the available grazing, offer supplements and molasses watered onto grass or crop residues.

- **Lease grazing**
  - Move animals to nearby areas where grazing is available as long as veterinary regulations are allowing, especially in resettlement areas. Give priority to young breeding stock and draft oxen.
  - **Survival feeding**
    - Give crop residues, hay, treated with molasses as urea and some commercial feed.

**Beef cattle in a feedlot**
Hand feeding animals should be done until conditions improve by giving them just enough to survive on either the veld or on penned. Penneled animals are offered a minimum of 4kg of feed per day and unlimited water. This should only be considered as a last option because it is expensive.

*The writer is the Principal Livestock Officer: Mashonaland West Province*
FREE-RANGE CHICKENS

To identify signs of disease early, it is important to be familiar with the characteristics of a healthy bird. A healthy bird displays the following traits:

- Erect stance with head and tail elevated
- Bright red comb and wattles (except for those breeds with blue combs, such as the silkie)
- Filled-out face parts
- Bright and alert eyes
- Clean nostrils
- Smooth, neat, clean feathers
- Filled-out legs
- Joints that are smooth and cool to the touch
- Weight that is typical for the type and age of the bird
- Powerful movements when struggling
- Scales on the legs and feet that are clean and waxy in appearance
- Colour of the skin that is characteristics of the breed and strain of bird, as well as the age and state of production

In addition, a healthy bird eats and drinks frequently and displays no signs of respiratory distress.

9 Things to Consider When Buying Chicken

Being an informed shopper starts with knowing what goes into foods, something that’s not always straightforward with fresh chicken. Not only must you decipher the stamps, logos, and labels, it’s also important to consider aesthetic indicators of freshness.

1. APPEARANCE AND AROMA

Fresh chicken should have a pinkish colour. Avoid cosmetic damages, such as bruising or tears in the skin, which can affect the chicken’s quality and freshness. Chicken should also be plump; when you press against it, the meat should be somewhat resilient, resuming its shape after a few seconds. A clean, neutral aroma is also a good indicator of freshness.

Avoid chicken with excess liquid pooling in the package. Excess liquid is typically the result of the water immersion process commonly used to cool chickens to a safe temperature. Once in the tray, the chicken purges these fluids, diluting the flavour and producing a soggy texture.

2. CHILLING PROCESS

Air chilling is the superior alternative to water immersion chilling. Do not expose the chicken to chemicals during the chilling process. The end result is chicken with a fresh, undiluted flavour that cooks up more consistently and remains juicy. And because it’s not waterlogged, the skin also crisps up to a nice golden-brown.

3. TRIM

Trimming and deboning chicken at home requires diligent food safety practices to prevent contaminating kitchen surfaces and utensils. Look for chicken that’s already been trimmed so you don’t have to worry about it.

4. RAISED WITHOUT ANTIBIOTICS

Interpreting label jargon for antibiotic-free use can be confusing because chicken can be labeled as either antibiotic-free or raised without antibiotics. To have antibiotic-free chicken, the producer needs to abide by the withdrawal or waiting period to ensure antibiotics are no longer present. Raising them without antibiotics assures consumers that chickens were never administered antibiotics at any point.

5. CERTIFIED ORGANIC

Organic certification requires that producers implement and follow ongoing compliance with several strict standards and practices.

6. PACKAGE LIQUID

This term indicates that the chicken was injected with or soaked in a solution during processing. Some processors inject the chicken with a flavouring solution, such as saltwater or chicken broth. These enhancements can add nitrates and nitrites and often raise the sodium level and take away the natural flavour of the chicken.

7. VEGETABLE-FED

Chicken labelled as vegetable-fed is raised on a diet that never includes animal by-products. Producers looking to cut costs and have undiluted flavour of the chicken.

8. NON-GMO PROJECT VERIFIED

This seal appears on chicken that was raised and fed on a certified organic, certified non-GMO diet that’s in compliance with Non-GMO Project standards. Non-GMO grains are a requirement for certified organic programmes.

9. ENHANCED

Enhanced chickens are important for efficient production and management. Poultry houses and shelters vary depending on availability of materials, weather and tradition. Choice of chicken housing should be based on cost, durability and usage.

Points to consider when selecting sites for poultry housing:

- A shady, dry flat ground. Alternatively the house can be elevated from the ground.
- Trees and bushes close to the houses provide shade, windbreaks and protect birds from flying predators.
- Secure premises near the family house. It is important to hear if the chickens get disturbed at night by predators or thieves.
- Select a site on which the poultry house faces South or East in wet regions. In a rectangular house the end walls should face East and West to ensure that only the end walls face the hot afternoon sun.

Materials for building a poultry house

- Always use cheap locally available material like bamboo, wood, reeds, thatch grass or clay bricks.
- Remove the bark from the wood to reduce the parasites load. Parasite often hide beneath the bark.
- Poultry houses should have windows on either side for ventilation. In addition, a hole or ridge on the roof will ensure proper ventilation and give light making it easier to work in the house. Make sure winds ventilate the house without making chicken cold.
- Heat, humidity, and harmful gasses may be considerably reduced through good ventilation. High temperatures may cause deaths, a drop in egg production, low shells quality and reduced weight gain. A combination of high temperatures and high humidity may cause death in young chicks.
- Placing perches and nests inside the house to safeguard chickens against various predators. Perches and nests will also help to keep chickens and eggs clean.
- Laying nests should be placed in a quiet place in the house.
- To protect against diseases and parasites the house must be easy to clean. It should be big.
- Make the nests and perches easy to remove when cleaning
- Houses or shelters should be sprayed with a vermicide or lime washed after cleaning to disinfect and kill parasite eggs from the walls and cracks. Place ashes on the floor and in the nests to discourage parasites.
- Clear grass and bushes for about 3 meters on all sides of the house to keep snakes and rats away
- Use wire (chicken and mesh wire) on windows to avoid predators and wild birds.
- Night houses/shelters should be built on poles, well above the ground to protect the chicken from predators such as dogs, rats and snakes.
- Build your poultry house to prevent possible injury to the birds. Remove any sharp edged objects from the house.
- For a round or square house give 1.5-2.0 m² for every 10-12 adult birds.

Free-range chickens

Characteristics of healthy chickens

Poultry (Chicken) Rearing

Extracted from Agropreneur Zimbabwe

Free-range chickens

Rearing chicken
**Common summer livestock diseases in Zimbabwe**

ProAgri — Specialist Writer

**SOUTHERN Africa can get really hot during summer, and these are the conditions under which various diseases thrive. Livestock farmers must know what summer diseases to look out for, what the symptoms are and how to treat them.**

All animals should be provided with nutritious feed, plenty of water, a clean pen protected from dampness, and drafts, and isolated from healthy animals. If these measures and your vaccine still does not help, the services of a veterinarian must be called in.

**Cattle diseases:**

**BLOAT**

Bloat is also called bousy or ruminal tympany, and is a disorder of ruminant animals involving distention of the rumen. Bloated cattle are very restless and noticeably uncomfortable. Bloat often occurs in cattle that have grazed rich, young crops, or ingested large amounts of concentrate rations.

**Signs**

The first sign of bloat is bulging of the area between the last rib and the hip. As gas pressure increases inside the rumen, the entire abdomen enlarges on both sides of the animal. This causes pressure and pain, resulting in difficult breathing.

**Prevention**

Bloat can be prevented by avoiding rich feeds such as lush alfalfa, and by feeding sufficient quantities of roughage with concentrates. Forgetting to feed the animal or changing its feed abruptly can also cause bloat.

**Treatment**

- Depending on the severity of the condition, it may be required to quickly relieve the gas pressure.
- Treatment means to slow down fermentation in the rumen and help relieve the excess gas pressure.
- Veterinarians have their own treatment methods that differ from animal to animal.
- For emergency treatment, cooking oil may be administered via the mouth.
- Another emergency treatment is passing a stomach tube or piece of garden hose into the rumen to release the gas, but this should be done by someone with experience.
- A veterinarian or an experienced farmer may also insert a surgical instrument, called a trochar, into the rumen through the exact place high up in the side of the animal to immediately relieve the pressure.

**WARTS**

Warts are viral infections of the skin and can spread among animals.

**Signs**

Warts commonly appear and spread slowly on the neck, shoulders, and head. Most warts are small, but in extreme cases, they become so large that they break off and can easily become infected.

**Prevention**

Isolating affected calves will help prevent the disease from spreading to others.

**Treatment**

Small warts often disappear without treatment, but larger warts will need to be removed and healed. Ask your veterinarian for the best treatment.

**THEILERIOSIS**

Theileriosis is a disease caused by a species of *Theileria* — a blood-borne parasite, or also called January disease. It only affects cattle and is primarily transmitted by ticks. To become infected by *Theileria*, a cow must be bitten by a tick carrying the disease. Once the animal is bitten, it takes about 6 to 8 weeks for the parasite to build up to significant levels in the blood.

**Signs**

- Pale or yellow, rather than healthy pink, vulva (open up the vulva to look at the colouring).
- Pale or yellow whites of eyes (a sign of jaundice).
- Lethargy — exercise intolerance, cows lagging behind on the walk to the shed.
- Sick cows not responding as expected to treatment for conditions such as milk fever.
- Cows are off their food and appear hollow sided.
- A decrease in milk production.
- Sudden death, especially in late pregnancy or early lactation.

**Prevention**

This disease can be prevented if you spray and control the ticks around the cattle.

**Treatment**

Immediately reducing pressure on the affected animal by:

- Milking once a day.
- Minimised handling.
- When bringing into the shed, let them go at their own pace (do not push them).
- Good quality feed.
- Medical intervention.
- Treatment of concurrent illnesses (for example ketosis or black mastitis).
- Supplementation of trace minerals and iron (hemo5 multi-mineral injection).
- Blood transfusions.
- Buparvaquone (Butalex).

**SHEEP DISEASES**

**Blue tongue**

Blue tongue is an insect-borne, viral disease affecting sheep, cattle, and goats. Although sheep are most severely affected, cattle are the main mammalian reservoir of the virus and are very important in the epidemiology of the disease.

**Signs**

- High rectal temperature (up to 42 degrees Celsius).
- There is swelling of the face and ears, and also pulmonary oedema which may cause breathing difficulties.
- Animals are stiff and reluctant to move.
- Eye and nasal discharges.
- Drooling as a result of ulcerations in the mouth.
- Swelling of the mouth, head, and neck.
- Lameness with inflammation at the junction of the skin and the coronary band.
- Difficult breathing.
- Abortion.

**Prevention**

The main prevention is vaccination. The vaccine also does not act immediately, with cattle requiring two doses of vaccine (the second at least 6 weeks after the first) to be protected.

**Treatment**

Treatment is limited to antibiotic therapy to control secondary bacterial infections. Sources:

- [https://www.canr.msu.edu/news/three_common_summer_cattle_diseases](https://www.canr.msu.edu/news/three_common_summer_cattle_diseases)
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