

DRY SEASON MANAGEMENT OF LIVESTOCK/ANIMALS

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What is a dry season?

- It is a yearly period of low or lack of rainfall particularly in the tropics.
 - The dry season has low humidity and some water sources and rivers run dry.
 - This lack of water/moisture leads to lack of feed (grazing).
 - The dry season is sometimes extended into a drought period.

What are the characteristics of a dry season?

- On the rangeland,
- On the animal,
- On the farmer.

On the rangeland

- Loss of nutritive value of range plants due to drying up and lignification leading to loss of quality.
 - Dry season grazing is fibrous and low in crude protein (CP).
- Reduced biomass of range plants leading to reduced quantities of grazing materials such as grass, shrubs and trees.
- Lack of soil cover leading to soil erosion and range degradation.
- Defoliation of trees, shrubs and grasses exposing the top soil to wind erosion.

On the animal

- Time spent grazing during the dry season increases from 10 - 12 hours as compared to 7 – 8 hours per day in the wet season.
 - The animal loses weight due to insufficient nutrients in the range plants to sustain animal growth.
- Distance walked to find grazing and back increases.
 - The time spent to and from watering sources also increases.
- Animal performance/productivity is decreased significantly.
 - Reduced milk production
 - Reduced fertility
 - Increased susceptibility to diseases
 - Increased morbidity and/or mortality

On the farmer

- Loss of animals due to starvation.
- Loss of income due to poor body conditioned animals not fit for sale
- Reduced milk production for nursing young ones due to insufficient nutrients for their mothers.

What is management?

- Management is the act of getting people and resources together to accomplish desired goals and objectives in an efficient and effective manner.
- Management comprises the following:
 - Planning
 - Organizing
 - Staffing
 - Directing
 - Controlling
- Good management precedes optimum production.

- *In a livestock production operation, management also refers to the day-to-day activities that are important for the successful implementation of the production plan such as:*
 - *Routine operations*
 - *Basic planning and overall business aspects.*

- *Good management undertakes to combine the following:*
 - **Breeding**:- it is the time when females are exposed to males for mating. It can be controlled or uncontrolled.
 - **Nutrition**:- it is when the animals are consuming feeds of a certain quantity and quality, and efficiently convert it to meet their nutritional requirements for growth and production.
 - **Health**:- this is about the well-being of the animals.
 - **Housing**:- it is the provision of kraals and other facilities for different classes of animals kept.
 - **Marketing**:- it is the disposal of the commodity produced for monetary gain usually at the end of the production cycle.

Production Systems

- There are three (3) production systems recognised the world over including Botswana.
- These are:
 - ***Extensive production system***:- this is where animals are raised and grazed in open rangelands (communal or fenced). The land area is usually large.
 - ***Intensive production system***:- this is where animals are kept in very small restricted land area and are not allowed to go out to graze. The animals are zero-grazed and feed is brought to them.
 - ***Semi-intensive production system***:- this is where animals are allowed to graze and are also given feed when the need arises to compliment and/or supplement any deficiencies that may negatively affect production of the commodity being produced.

- Regardless of the production system chosen, production does not occur in a vacuum:
 - It needs to be managed.
- There are various management systems dependent on the species of livestock being raised and the production system being implemented.
- Remember that management is all about allocating available resources to the day-to-day activities involved in running any livestock production operation.
 - Nothing else.

What is the most important parameter to consider in a livestock production operation?

- Parameters to consider in a livestock production operation are as follows:
 - Breeding
 - Nutrition
 - Health
 - Housing
 - Marketing

Dry Season Nutritional Stress in Livestock (Ruminants)

- The poor quality grazing low in protein affects the function of the rumen.
 - Efficient rumen function depends on supplying sufficient nitrogen (N) from protein to act as fuel for the growth of cellulolytic bacteria.
 - Cellulolytic bacteria are responsible for fermenting (breaking down) fibrous feeds such as dry grass and crop residues.
 - Dry season feeds require supplementary N supplied as non-protein nitrogen (NPN or urea) in conjunction with a readily available source of energy (molasses).
 - True proteins such as beans, cowpeas, lablab and lucern hay, oilseed cakes (cottonseed, sunflower-seed, canola-seed, morama, etc) also contain energy but can be costly.
- Lack of these during the dry season will cause nutritional stress.

- Before we can discuss what is required to manage the dry season environment, there are two general points that need to be considered seriously by all livestock producers.

1. *Choice of breed of animal*:- an animal must be adapted to its environment both in its ability to tolerate the stresses of that environment and its nutritive requirements relative to the amount of feed on offer.

- Introducing large exotic breeds with high production potential will not succeed unless management, including nutrition, can also be changed, which is difficult for resource-poor farmers.
- Our medium size indigenous Tswana or Tuli cattle produce the highest weights of weaners, per cow per year, compared to these exotic breeds.

2. ***Water intake***:- this is related to dry matter intake.

- In a dry hot climate there are differences between breeds in their water requirements, and the *Bos indicus* cattle have a lower intake than the *Bos taurus*, the difference increasing as ambient temperatures increase.

Table 1. Water needs for different classes of livestock based on air temperature

Livestock	Water needs/animal/day (32°C)
Dry beef cows	91 – 136 litres
Lactating beef cows	113 - 159 litres
Lactating dairy cows	136 – 180 litres
200 kg weaner calf	45 – 68 litres
Horses	91 – 114 litres
Sheep and goats	14 – 18 litres
Bulls (minimum)	45 litres

NB. Failure to provide enough water will reduce animal performance more quickly and severely than any other nutrient

- During prolonged a dry season or a drought, nitrate problems can be greatly increased due to increased concentrations in surface water.
 - Overgrazed pastures are common during the dry season with loss of tree canopy cover.
 - Increased runoff may then occur collecting fertilizer and other minerals attached to soil particles

Table 2. Levels of nitrate compounds in water and their potential risks for cattle.

NO₃ (mg/L)	NO₃-N (mg/L)	Comments
0 – 44	0 – 10	Safe for consumption
45 – 132	11 – 20	Safe with low-nitrate feeds
133 -220	21 – 40	Potential harmful if consumed over long periods
221-660	41 – 100	Risk of death
>661 >101		Unsafe for consumption

NB. Sulphates and other toxic compounds such as heavy metals are also a concern; microbial agents of concern are faecal coliforms and cyanobacteria. Pathogens coming from fecal matter can become a severe problem during the dry season and drought if animals are drinking from streams or inappropriately managed ponds/dams.

- The development of mud puddles in both streams and dams with increased coliform counts is likely during the dry season.
- If in doubt of the suitability of livestock water source, farmers should take water samples and submit them to government or private laboratories for analysis.

Dry Season Management Strategies

- Natural rangelands in Botswana form the basic feed resource for livestock production.
- The livestock population tends to follow the pattern of drought, decreasing during drought periods and increasing during rainy periods.
- Large areas of Botswana's rangelands are now in a very poor condition due to overstocking, overgrazing and mismanagement.

- The following strategies should be considered:
 - Harvesting the green rainy season biomass:
 - Which is highly nutritious and can be dried and stored for use during the dry season.
 - Fodder production:
 - Fodder crops such as maize, sorghum, millet, buffel grass, elephant grass, sugar beet, cowpeas, beans, lablab, lucerne, sunflower, soybean, leucaena, salt bush, sprouts, legume-grass mixture, etc.
 - Crop residues:
 - Harvested and stored following grain harvest (stovers, straws, plants not reaching maturity, etc) and/or processing (husks, chaff, cobs, hulls, brans, chop, grains not meeting grading standards, leaves and stems, root/tubers. etc).
 - Industrial by-products of crop/fruits processing (molasses, citrus pulp, oilseed cakes.

– Silages and hays:

- Most tropical grasses do not produce good silages.
 - Many are low in sugar and tend to be coarse and as such, do not pack well and often have higher water content.
 - Additionally, the higher environmental temperatures in the tropics promote extensive fermentation.
 - Again, forage conservation starts very late when the nutritive value of crops are extremely low.
 - Hay on the other hand is a young growing crop that is cut before or around flowering stage while its nutritive value is at its highest and dried in the sun for 3 – 5 days after cutting. It is thereafter baled and stored as dry material for longer shelf life.

– Concentrates:

- These are either energy concentrated feeds (cereal grains, oilseed cakes, etc) or protein dense feeds (bean family) and feeds that contain both energy and protein in high concentrations.
 - These sources of feeds are usually very expensive to purchase and are better used in combination with the poorer types of feedstuffs such as stovers, straws, brans, poor quality hays and grasses for cost-effectiveness.
- Minerals and vitamins:
 - Tropical grasses contain fewer minerals and vitamins during the dry season and as such, more deficiencies occur during this time.
 - » One of the most striking results is phosphorus deficiency that leads to a depression in the reproductive ability of animals to breed, especially observed infertility of young bulls, bucks and rams.
 - Minerals and vitamins are more effectively and efficiently supplied in licks such as winter, summer, production, protein-energy licks.

- There are also some injectable mineral and vitamin preparations that can be used for individual animals depending on their prevailing condition.
 - Such as those calving/lambing/kidding during the dry season and are in a very poor condition.
- In Botswana however, dicalcium phosphate (DCP) and salt are provided to the animals throughout the year since the country's soils are deficient in phosphorus and salt is added to provide tastiness to a tasteless (DCP). Salt as a mineral is also needed in the animal's body.

– Supplementation:

- This is carried out when animals are not getting enough nutrients in their daily rations to meet their daily nutrient requirements for maintenance and production.
 - Animals are starved and thus cannot perform (breed, grow, produce adequate milk or meat) to their genetic potential.
 - Animals usually lose weight during the dry season because of lack of adequate nutrients in their diets.
 - To reverse this situation, supplementary feed is offered to the animals at least for survival purposes only.

Results of Good Nutrition

- Good nutrition is attained through appropriate feeding of balanced rations to animals raised.
- Appropriate feeding results from feeding feeds of appropriate quality in appropriate quantities.
- Animals having good nutrition will attain good health since they are not likely to succumb to simple ailments that they can shrug off only by being healthy.
 - Their immune systems are working effectively and efficiently.

- Animals in a good health shall attain puberty early or the right time for that particular species and breed.
 - The females will start to mate with males and the breeding process shall be initiated.
 - Animals that are well-fed and well-cared for will reproduce and give birth to healthy offsprings and the breeding process shall end with weaned offsprings and the breeding process repeated once again.
- Young animals resulting from the breeding process shall have to be looked after accordingly by providing the right kind of shelters/housing that will expose them to adverse environmental conditions such as lack of bio-security (good sanitary conditions) and protection from extreme weather conditions.

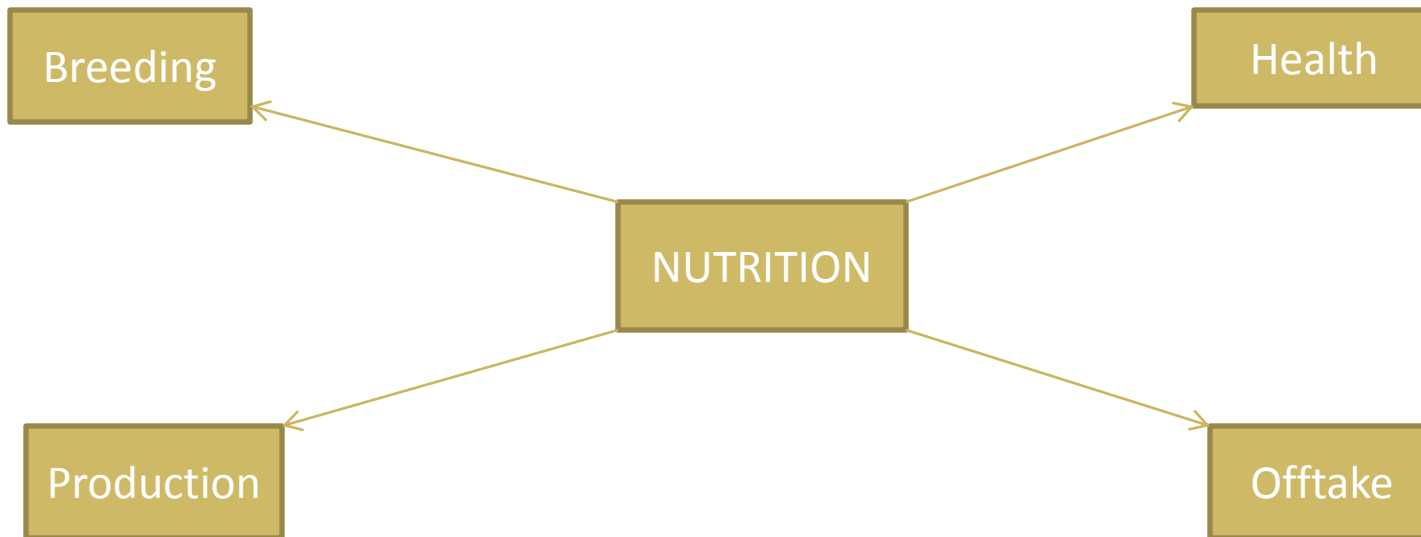
- Well-cared for weaners of any species of animal raised are the units/outputs for sale for the farmer/producer.
 - They now become the focus of marketing material and as such they should also receive the utmost attention since they are the ones to generate income for the operation.
 - Thus nutrition and health-wise they are now valued in monetary terms dependant as to at what age the farmer would like to dispose them off.
 - With appropriate decisions taken as when to sell, these animals should be able to generate enough income to recover the costs incurred to produce them in the not distant time period depending on the objectives of the operation.

Marketing

- Marketing channels should have been identified well before the operation was started.
 - The best one should have been chosen then.
- A marketing strategy should also have put in place well before the first units of production are realised.
 - The magnitude of the offtake and the extent of sustaining that market outlet should also have been determine prior to implementing the production plan.
 - Market standards and livestock regulations dealing livestock marketing should now be known by the farmer/producer.
 - Issues of compliance as per Veterinary requirements must be known by the farmer/producer without any excuse.

Animal Health Management During the Dry Season

- As indicated earlier on in this workshop, animal nutrition is the central and most critical point in the continued performance (existence) of any animal on this planet (including human beings).
 - We keep livestock to mainly provide food for us.



- A malnourished animal is a weak animal that is always susceptible to diseases of any kind since its immune system is compromised.
 - The immune system is composed of many things including antibodies which are made up of proteins and energy (carbohydrates and fats) which are found in the feed and determine the quality and quantity of the diet given to the animal of any species, age, class, sex and weight.
 - The immune is also supported by vitamins and minerals that are constituents of feed that provide nutrients to the animal if given in the right amounts.
 - In addition to the above, clean and adequate water should always be provided *ad libitum*.
 - ***That is when we can say the animal is well-nourished according to its nutrient requirements.***

What are the dry season factors influencing the health of livestock?

- General animal diseases prevailing during the dry season.
 - Outbreaks of uncommon diseases and conditions.
- Nutritional diseases (mostly deficiencies).
- Internal and external parasites
- Plant poisonings

General Diseases Prevalent During the Dry Season

- Because of the unthriftiness of livestock during the dry season, the following diseases are normally observed:
 - Nutritional deficiencies (Aphosphorosis, Botulism, etc)
 - Internal and External Parasites (roundworms, tapeworms, fluke worms, ticks, lice, mites, etc)
 - Diseases caused by pathogens (Heartwater, Anaplasmosis, Botulism, Pasteurellosis, Pulpy Kidney, coccidiosis, Salmonellosis, etc)
 - Plant poisoning (*Dicapetulum cymosum*; *Pavetta harborii*, Monyelenyele, Mahamba-ka-ntwana, etc)
 - Abortions and Retained Afterbirth Membranes, Stillbirths, etc.

- Dry season management has to look into all these aspects and prioritise them and then cost them to assess one's ability and capability to plan appropriate mitigation strategies possible.
- There are many possible interventions that can be undertaken successfully if prior planning well in advance of the onset of the dry season is considered.
- Possible interventions to consider may be as follows:

- Identify unproductive animals among your herd/flock for culling while they are still in a very good body condition and sell to the highest paying market outlet.
- Save the proceeds of the sale to later purchase inputs such as
 - Vaccines/dewormers for inoculating your animals against potential diseases that occur during the dry season.
 - Supplementary feeds, licks, vitamin/mineral injections and dips to give to your animals during this period.
 - Maintain a smaller manageable herd and restock during the wet season where appropriate.

- Where there are no cull animals to be sold, sell a few to support the rest of the herd/flock without having to go for a bank loan to avoid attracting interest charges.
- In a real life situation, you raise these livestock to benefit from them **financially OR materially**.
 - **They should not be treated as objects to admire.**

THANK YOU