

Optimization of Beef (weaner) production – Dr JM Rust

Any livestock (animal) farming operation consist of 4 or 5 basic elements

1. Nutrition
2. Health
3. Breeding (Genetics)
4. Reproduction
5. Basic management including marketing and selling of products in order to make a profit

(This lecture will only deal with the last two aspects)

Nutrition (This is probably the most basic element of cattle farming)

- If the animals do not have food they will not produce
 - Low meat production
 - Low milk production
- If the animals do not have food they will not reproduce
 - Few or no calves will be born (calving rate)
 - Calves will not survive to weaning (weaning rate)
 - Cows will be calving at the wrong time of the year (in winter when food supply is at its lowest)
- If the animals do not have food they will not grow properly
 - Young calves will not grow quick enough to be marketed
 - Adult animals will loose weight at certain crucial (bad) times of the year
- If animals do not have food they will become sick much quicker than those in good condition
 - The body system of these animals is under stress and the immune system will not work as good as it should (why do people get colds and flu)
 - Internal parasites (worms) will affect them quicker (competition for food in the body is bigger when the parasites join in)



- External parasites (ticks) will affect them quicker (same as above
en tick-borne diseases will set in quicker)

If animals do not have food they will die eventually

- For a farmer with many cattle a few deaths will not mean much but for a farmer with only 10 cattle it is a huge loss
- For every animal you loose you must actually calculate double the cost to replace it (one less to sell and one more to buy to replace let alone the possible calves from that cattle that is also lost)

Reproduction

- Each adult cow must produce at least one calf per year (that calf must survive at least till weaning)
- Cow must be in good enough condition and healthy enough to be able to produce a calf
 - Become pregnant
 - Maintain the pregnancy
 - Be able to calf normally (sometimes you loose a lot of cows and calves at calving because the cows are to weak to calf)
 - Must be able to look after the calf for \pm 6 months
- Bull must be in good condition and healthy to produce good quality semen and have enough energy to serve all the cows (30/bull)

Importance of Reproduction

Reproduction is probably one of the most important aspects of farm animal production

If farm animals do not reproduce, the total production system will collapse in the long term

The farmer will be able to absorb it in the short term but not for a long period of time

Example for cattle: For every cow that does not calve, you need 2 extra calves to cover for the loss in production (one less calf and a passenger cow for another year)

What is the situation we are facing with farm animals in the developing agricultural sector?

- Low reproduction rate (can be as low as 25-35%)(Commercial farmers only achieve 65% on average)
- Animals calving/lambing at the wrong time of year
- High mortalities amongst offspring
- Low weaning rate
- Females not calving/lambing regularly
- Females calving/lambing at a too young age (females taking longer than normal to reach puberty)
- Herd structure abnormal (too many males and castrates)
- Animals suffering from disease
- Animals suffering from deficiencies
- Animals under nutritional stress for biggest part of the production year
- Low growth rate amongst calves and lambs
- Animals usually not in marketable condition
- Drastic condition loss amongst lactating females

What is the ideal situation?

- A female must start producing calves/lambs soon after reaching puberty
- After that, a mature female must produce at least one calf/lamb per production year
- The calf/lamb must survive and grow at an acceptable rate till weaning
- The ratio of males to females should be such that only all females are covered
- After weaning the offspring must either be sold
- Kept to be marketed at a later stage
- Kept as a replacement or production animal

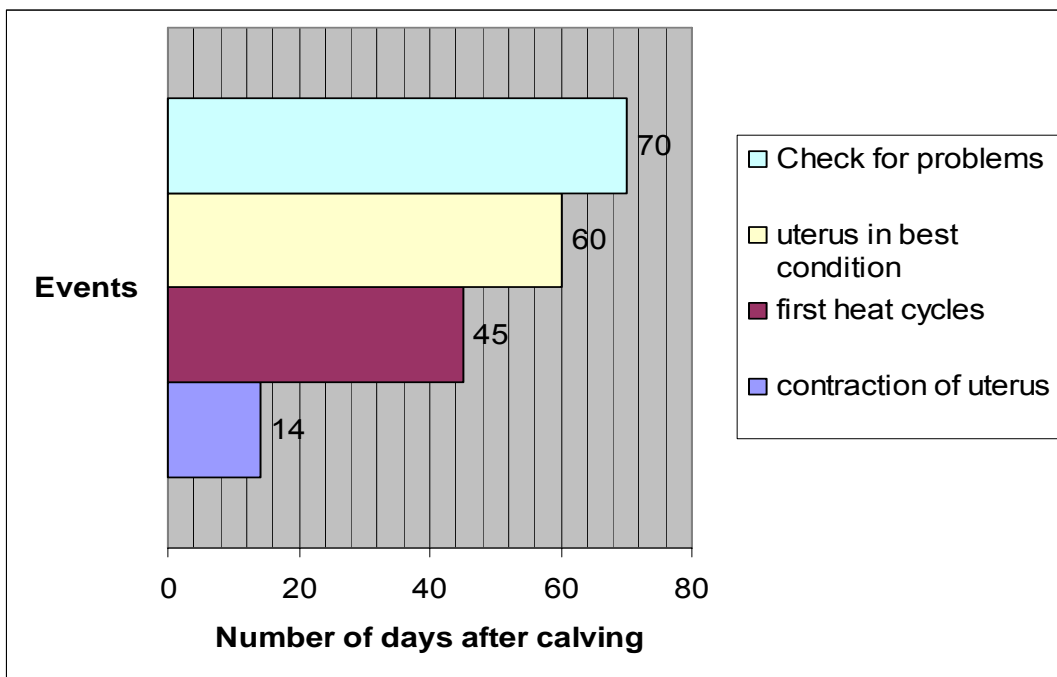
To produce one calf per year (Example cattle)

What happens during this year?

- Gestation/pregnancy: ± 275 days
- Uterus recovery: 60 days (335 days)
- Rest of the year: $365 - 335 = 30$ days
- Cycle of the cow: ± 21 days

The cow has ± 2 cycles to conceive again

Duration of events after calving



What is needed to produce 1 calf/lamb per year?

- Fertile, well conditioned and disease free female that will cycle and ovulate during the given period
- Fertile, well conditioned and disease free male or good quality frozen semen if AI is used
- Good reproduction management (heat observation, semen handling and AI technique if AI is used)
- Conducive conditions for the female to maintain pregnancy for 9/5 months

Reproductive efficiency of the female

What must be done to ensure that a calf/lamb will be produced every year?

- Animal must be kept in good condition before calving/lambing
- Animal must be kept in good condition after calving/lambing

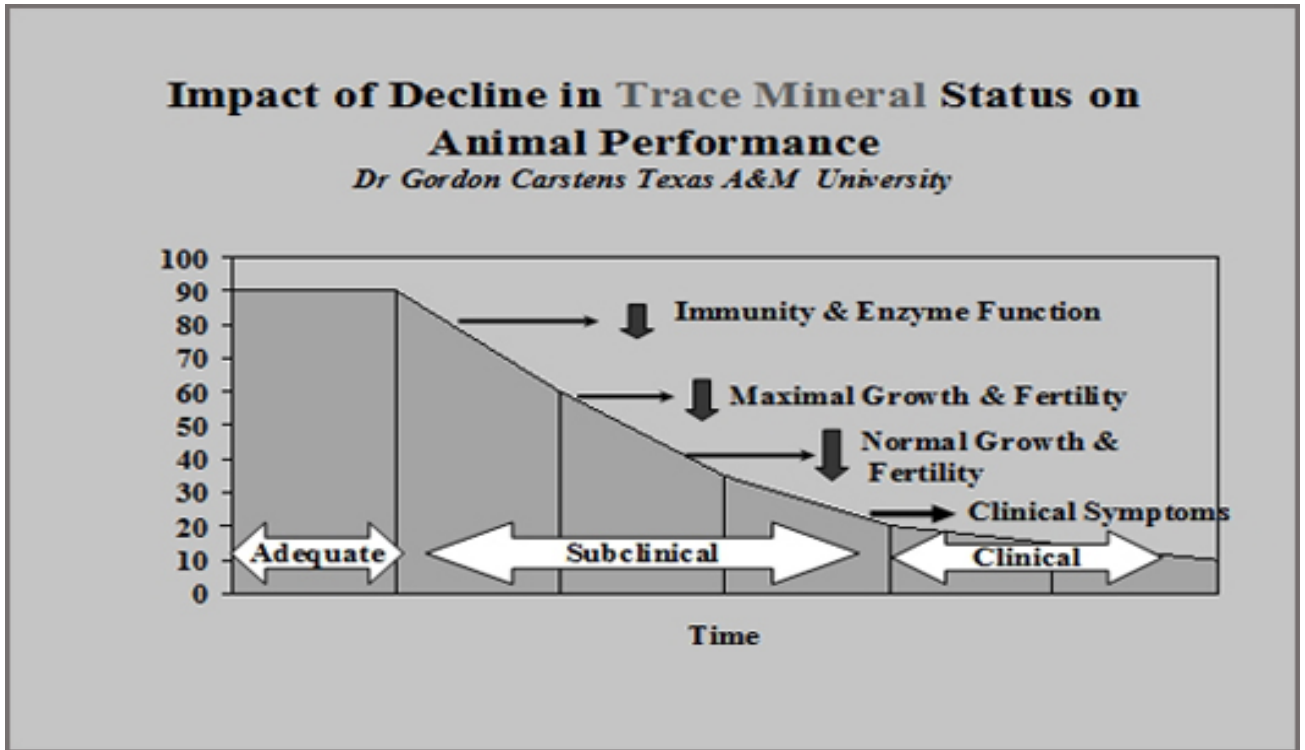
Mineral supplementation

- Selenium
- Copper
- Zinc
- Manganese
- Cobalt
- Phosphate
- Calcium

Vitamin supplementation

- Vitamin A
- Vitamin D
- Vitamin E

The effect of trace mineral deficiency on physiological functions



Animal must be disease free

- Diseases of the reproductive organs
- Infectious diseases
- Functional or Physiological infertility
- Hereditary infertility

Diseases affecting reproduction in cattle

- **Diseases (abnormalities) of the female reproductive organs**
 - Infection around the ovarian structures which can cause adhesions
 - Infection and blockage of the fallopian tube
 - Infection in the uterus (metritis)(pyometra)(hydrometra)
 - Retention of the placenta
 - Prolapse of the uterus

- **Infectious diseases**
 - Trichomoniasis
 - Vibriosis
 - Vaginitis
 - Epididymitis
 - Brucellosis
 - All infectious disease that may cause loss of condition, fever and general stress conditions

- **Functional/Physiological infertility**
 - Anestrus
 - Sub-Estrus
 - Underdeveloped (hypoplastic) ovaries
 - Static ovaries
 - Delayed ovulation
 - Anovulation
 - Follicular cysts
 - Lutenized follicles
 - Luteal cysts
 - Retention of the corpus luteum

Hereditary infertility

- Hypoplasia of the reproductive organs
- Double cervix
- Enlarged and deviated cervix
- Prolapse of the vagina
- White heifer disease (physical barrier in the vagina)
- Hermaphrodite
- Incapability to serve
- Cryptorchidism
- Scrotal hernia
- Navel hernia
- Calving difficulty
- Defect sperm
- Hormonal disturbances

Reproductive efficiency of the bull

The most important aspects are the disease status reproductive organs, semen quality and ability to serve cows (libido)

What do we look for when selecting a breeding bull?

1. What breed do we need (milk, beef or dual purpose)
2. Animal must be healthy with no obvious abnormalities
3. Normal reproductive organs (internal, external and semen quality)
4. Should come from a cow with a proven record (fertility and longevity)
5. Above average growth rate of calves and siblings
6. Should have above average breeding values if available
 - a. Low birth weight
 - b. Above average for weaning weight and 18 months
 - c. Not too high for adult weight
 - d. High maternal breeding values which should translate into good milk production in female offspring
7. Should not look like a cow (feminine) or ox-like
8. Dark discolouring of front quarter (hormonal balance is good)
9. Not too young, not too old
10. Good temperament (not too aggressive or wild)

Basic Management

Land/Grazing

- Fenced camps
- Rotational grazing
- Resting some camps
- Burn access plant material after first Spring rain (do not burn everything $\pm \frac{1}{3}$ of grazing land every year)(you need some reserve if the rain does not come again soon)
- Sufficient water points (if animals have to walk long distances to water they spend a lot of energy which could have been used for growth of milk production)
- Stocking rate for that area must be followed
- You have to provide a good lick at least during winter periods when the quality of the grass is low

Animals

Practical tips

- Do not use too old bulls
- Do not use too young bulls
- Mate heifers before cows (3-4 weeks)
- Give heifers longer second mating season after first calves
- Allow the correct number of females per male
- Do regular pregnancy diagnosis
- Test male fertility before breeding season
- Cull all non-pregnant females as soon as possible after pregnancy diagnosis
- Do regular disease control (vaccination, internal, external parasite as well as screening)
- Close monitoring of the nutritional level of the herd (should be around 2.5 on a scale of 1-5)
- Adequate supplementary feeding during winter months
- Only keep replacement animals from parents with proven fertility record
- Practice seasonal breeding in order to have the best grazing available for cows with small calves

Marketing

We are farming to make money. Making money is one thing but making profit is another. Remember to keep record of all income and expenses and deduct the cost from your total income. We have to start farming cost effectively and make a contribution to total production from livestock farming in SA. We are not producing enough food even to satisfy the needs of our own people.