

Feeding management of cows

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How does cow's digestive system work?

Holistic management of cows

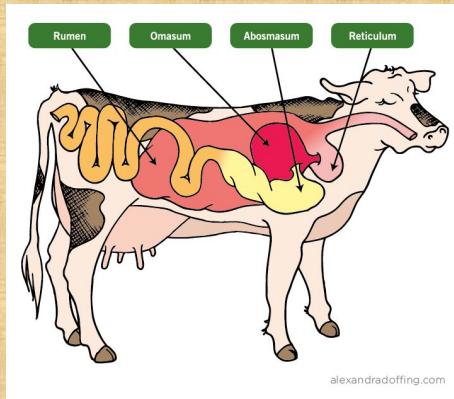
Cows should be managed in such a way that they get
Free access to

- Water
- Fodder; **Mother nature has designed cows to thrive on grass and grass alone**
- Mobility
- Companion

Herbivores

- Which puts on mass by consuming plants
- Their diets are composed primarily of plant material

Digestive system



Prehension

- A ruminant uses its mouth (oral cavity) and tongue to harvest forages during grazing or to consume harvested feedstuffs
- They typically spend more than one third of their time grazing, one-third of their time ruminating (cud chewing), and slightly less than one-third of their time idling where they are, neither grazing nor ruminating.

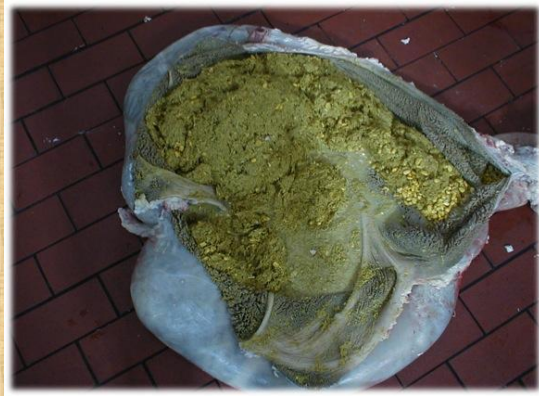
Rumination

- The process of swallowing, “un-swallowing”, re-chewing, and re-swallowing is called “rumination,” or more commonly, “chewing the cud.”
- Rumination enables cows to chew grass more completely, which improves digestion.

Cud chewing

- Rumination reduces particle size of fiber and exposes sugars to microbial fermentation.
- Forage and other feedstuffs are forced back to the mouth for further chewing and mixing with saliva.
- This cud is then swallowed again and passed into the reticulum.
- Then the solid portion slowly moves into the rumen for fermentation, while most of the liquid portion rapidly moves from the reticulorumen into the omasum and then abomasum.

Rumen



Reticulum



Omassum



Abomassum



Rumen digestion

- The solid portion left behind in the rumen typically remains for up to 48 hours and forms a dense mat in the rumen, where microbes can use the fibrous feedstuffs to make precursors for energy.
- The rumen is the largest stomach compartment, holding up to 40 gallons in a mature cow.
 - . Rumen microorganisms (primarily bacteria)

Rumen microflora

- Digest cellulose from plant cell walls: There is lot of energy in cellulose,
- Digest complex starch,
- Synthesize protein from nonprotein nitrogen, and synthesize B vitamins and vitamin K
- There are more bacteria in one rumen than there are people on Earth. The no of microbes in one drop of rumen fluid is more than 10 times bigger than the no of people on earth.
- 1,000,000,000,000 org/ml. Total 160 litre capacity

Same in soil too

Soil Life (micro)

One tablespoon of soil has approximately 1 billion soil microbes:

- Bacteria: 3,000,000 to 500,000,000
- Actinobacteria: 1,000,000 to 20,000,000
- Fungi: 5,000 to 1,000,000
- Yeast: 1,000 to 1,000,000
- Protozoa: 1,000 to 500,000
- Algae: 1,000 to 500,000
- Nematodes: 10 to 5,000



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The soil microbes in the plow layer has the mass equivalent of two cows (2400 lbs) per acre that need to be fed



Soil organisms are much like cows, they need inputs of plant residues for food and energy

Specifically, they need the carbon that is contained in plant residue and soil organic matter

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Feeding the bugs

- Bacteria and other microorganisms are ingested on feed or obtained from other animals.
- If the cow eats feed that her rumen bacteria utilize, the population will grow. As the population grows the cow can digest more of the food she eats.
- If a cow doesn't eat what her rumen bacteria utilize, the microorganisms die. This is why cattle raisers say that they feed rumen "bugs," not the animal.

HOUSE OF THE BUGS

“WHAT RUMEN IS TO THE COW,
SOIL IS TO THE PLANT “

This relationship of cows to micro organisms is parallel to the dependence of plants on soil micro organism to make nutrients available

Provide adequate feeder space



Lack of feeder space in open housing



PASTURE FEEDING गोचर विषय

4.1.0.27 AV 12.4.27 Time to release Cows for Pastures प्रातः काल
गोचर
यावदस्या गोपतिर्नोपशृणुयाददचः स्वयम् ।
चरेदस्य तावद्गोषु नास्य श्रुत्वा गृहे वसेत् ॥ अथर्व 12-4-27

Morning strains of mantras when heard being recited at Agnihotras indicates the time to release cows to go to pastures for self feeding.

Cows are self feeders. By grazing they are working for us through the process of Animal impact

4.1.0.28 AtharvaVeda 12-4-28

Stall feeding is harmful घर में गौ को बंध कर मत रखो

यो अस्या ऋचउपश्रुत्याथ गोष्वचीचरत् ।

आयुश्च तस्य भूतिं च देवा वृश्चन्ति हीडिताः ॥
अथर्व 12-4-28

One who keeps Cows at home to feed even after hearing the morning mantra patha suffers in life.

The function of grazing is their utility. If they are not grazing they can become a liability

4.1.0.29 AtharvaVeda 12.4.29 Time to stay in Pastures

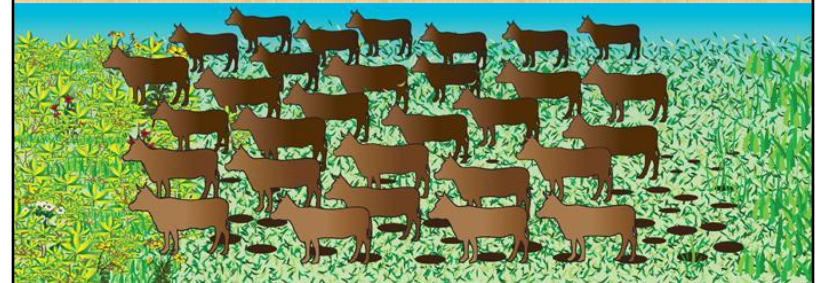
गोचर में रहने का समय

वशां चरन्ति बहुधा देवानां निहितो निधिः ।
आविष्कृणुष्व रूपाणि यदा स्थांम जिघांसति ॥ अथर्व 12- 4-29

As long as the cows like to feed in pastures they represent community assets. When cows want to retreat from pastures they indicate it by many signs.

गोचर में गौएं समाज की धरोहर के रूप में रहती हैं। जब वे पुनः अपने गृह स्वामी के स्थान जाना चाहती हैं, स्वयम् संकेत करती हैं।

Every move into fresher pastures
leaving behind grazed grass to regrow



Bites/min

- The cow has to graze 60 kg in 8 hrs of grazing .
- 7.5 kg in an hour.
- 125g in a min.

- This is possible only if there is adequate freshness and at least 30 cm Of grass height.

More than 30 cm height for grass



Less than 30 cm height for grass



Preferential grazing



4.1.0.30 AtharvaVeda 12-4-30

आविरात्मानं कृणुते यदास्थाम जिघांसति।
अथो ह ब्रह्मभ्यो वशा याञ्च्याय कृणुते मनः॥
अथर्व 12-4-30

Cow herself indicates the time for her to go back to her home for help from her master

जब गोचर से गृह स्वामी के पास जाने का समय होता है गौ स्वयम् ऐसे संकेत देती है।

Gut fill and skin coat



Manure Quality

- ❖ The quality of the manure is so important!!
- ❖ This lets you know how the cows rumen is functioning and if she's getting enough of what she needs
- ❖ Also indicates improper balances in the diet



Observation

- ❖ Observation is SO Important!!
- ❖ Get out there and observe your livestock.
 - ❖ Observed from a distance
 - ❖ Then move up close
 - ❖ What did you notice?
 - ❖ Did their behavior change when they saw you?
 - ❖ Were they grazing or bawling or laying down?

4.1.0.39 AtharvaVeda 12-4-39

Pastures should have free access गोचर महत्व
महदेषाव तपति चरन्ति गोषु गौरपि ।
अथो ह गोपतये वशाददुषे विषं दुहे ॥
अथर्व 12-4-39

Barriers in pastures angers the cows, the milk
from such cows is likened to poison.
(महदेषाव - Big barriers)

4.1.0.53 AtharvaVeda 12-4-53

यदि हुता यदयहुताममा च पचते वशाम् ।
देवीन्त्सब्राह्मणा नृत्वा जिहनो लोकाग्निर्च्छन्ति ॥
12-4-53

Such a person and society that keeps its cows in
confinement in their homes, suffer fall from grace
of learned people and Gods.

जो यज्ञादि के कारण गौ को निज गृह में बांध कर ही
रखता है, वह समाज और देवों के प्रति पाप कर और
समाज को हीन बनाता है।

Dry matter requirement for cows

- Dry matter is the nutrient content available once water is removed from any food and it is inclusive of carbohydrates, proteins, vitamins and minerals
- Cows require 2-3 % of its body weight
- Therefore a 400 kg body weight cow will need 8-12 kg dry matter per day
- Green grass has approximately 20% dry matter

- 400 kg cows therefore needs 40-60 kg grass daily if they are to be maintained only on fodder
- Paddy straw has 90% dry matter but has no digestible proteins and hence cannot form the only fodder supplied if they are to be maintained only on fodder
- Supplements may have to be given if the dry matter met from fodder is of poor nutritive status

4.1.0.8 AV 12-4-8 Protect Cows from attack by birds

यदस्या गोपतौ सत्या लोम ध्वाङ्क्षो अजीहिडत् ।
ततः कुमारः म्रियन्ते यक्ष्मो विन्दत्यनामनात् ॥
अथर्व 12-4-8

If crows are allowed to attack a cow, the lazy care taker of cows will suffer from tuberculosis.

4.1.0.6 AV12-4-6 Do not make Cut marks on Cow ears

गौ की पहचान के लिए कान मत काटो
यो अस्याः कर्णावास्कुनोत्या स देवेषु वृश्चते ।
लक्ष्मं कुर्व इति मन्यते कनीयः कृणुते स्वम् ॥ अथर्व 12-4-6

Those persons who make cut marks on cow's ears for identification, are as if cutting short their own wealth.

4.1.0.3 AV 12-4-3 Underfed Cow's Curse

कूटयास्य सं शीर्य-ते श्लोणया काटमर्दति ।
बण्ड्या दहय-ते गृहाः काणया दीयते स्वम् ॥
अथर्व 12-4-3

Society that trades in unhealthy cows gets destroyed By curse of unhappy cows.

Analysis of feed and fodder

S l	Type of food	Nature	Type
1	Grains like maize,Rice etc	Dried & Not wholesome	Rajasic
2	Oil seed cakes	Dried , not wholesome & Remnant	Rajasic & Tamasic
3	Green fodder (Grazing)	Wholesome,juicy	Sathvic
4	Paddy straw	Dried,Not wholesome & Remnant	Rajasic & Tamasic
5	Salt, Minerals & Vitamins added	Dried,Not wholesome,Synthetic	Rajasic & Tamasic
6	Jowar/Maize/Paddy fodder which is fed fresh at the juicy stage of grain	Wholesome	Sathvic

“Om Surabhyai namah”



Thank you