Theme 3: Animal Nutrition and Feeding

MANURE SCORING AND EVALUATION

(Level 3)

Topic	Training & information Content
3.1	Estimating feeding value of fodder & feed on dairy farms
3.2	Sampling feeds & forages/analysis interpretation
3.3	Estimating Dry Matter intake for various breeds/age categories of dairy cattle in the tropics
3.4	Reviewing feed intake, rumen fill, Body Condition Scoring (BCS)
3.5	Life weight estimation of cows
3.6	Rumen fermentation
3.7	Mineral & vitamin requirement, guidelines
3.8	Manure scoring and evaluation
3.9	Guidelines for ration calculations for various breeds, heifers, lactation stage (Rumen8)
3.10	Use of Rumen8 software for ration calculation
3.11	Optimization of ration with Rumen8
3.12	Feeding management guidelines
3.13	Feeding management of dry cows/close up
3.14	Feeding systems
3.15	Metabolic disorders
3.16	Scoring locomotion and hoof condition
3.17	Mycotoxin in dairy cattle nutrition
3.18	Heat stress in dairy cattle nutrition
3.19	Monitoring feeding management, using KPIs (based on Rumen8)

1. You will learn about (learning objectives):

- ❑ How to judge the cow’s manure
- ❑ Impact of feeding on the cow’s manure
- ❑ Manure as a health characteristic
- ❑ How to use the cow’s manure as a management tool
- ❑ How to analyze manure after sieving

2. Background

- Far too often cow manure is seen as a useless waste product
- Cow manure can tell us a lot about the ups and downs of the cow
- The manure is also an indispensable aid for optimizing (milk) production
- We can collect a lot of information that relates to the health of the cow from the manure . For example, manure sometimes shows whether a health problem is developing, even if we have hardly been able to detect the problem with naked eyes

2.1 Background Cont’d…

- As a livestock farmer/veterinarian, being able to score well on the cow's manure can provide a lot of information about the health status of the cow. The composition/digestibility of the ration can also be properly analyzed
- However, it is important that you are well informed about the composition of the ration before you can properly assess the manure, so that you can then take action that leads to improvement

3. Manure (Dung) Scores

- Scores range from 1 to 5

= 1

= 2

= 3

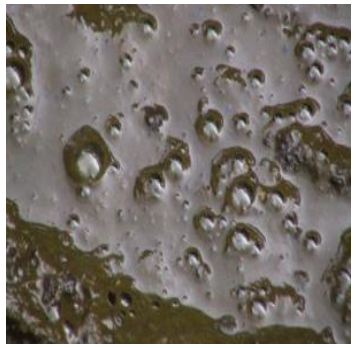
3.1 Manure (Dung) Scores Cont’d…

- Scores range from 1 to 5

= 4

= 5

3.2 Manure (Dung) Scores Cont'd…

Score 1: Represents watery diarrhea and is common in cows with an infectious disease. A thorough physical examination should be done and a veterinarian should be contacted for any cow with this score		1
Score 2: Is often associated with lush pasture (more likely at the start of the wet season) or a ration imbalance. If multiple cows within a herd fall under this score, the ration should be re-evaluated		2
Score 3: Is the ideal score for lactating cows with proper ration. They make a well-circumscribed pad that spreads and has a thickness of about 2 cm		3

3.3 Manure (Dung) Scores Cont'd…

Score 4: Is common in heifers and dry cows, but implies an improper ration for lactating cows		4
Score 5: Is usually representative of a ration imbalance and is seen in dry cows and heifers, quite often in combination with poor access to water. Cows have difficulties with defecating manure		5

3.4 Manure (Dung) Scores Cont'd…

- To produce milk optimally, a cow's manure should not score 1 or 5. Score 3 is the most ideal.

4. Manure Score assessment: Score 1

- Score 1: Represents watery diarrhea and is common in cows with an infectious disease. A thorough physical examination should be done and a veterinarian should be contacted for any cow with this score

- Manure score 1 is very unusual. If it happens quite often it is a cow problem and not a herd problem

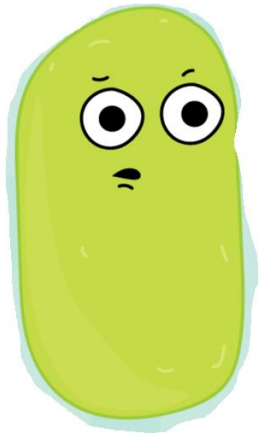
4.1 Manure Score assessment: Score 1 Cont'd…

Diarrhoea on herd level could possibly be:

• Johnes Disease (Paratuberculosis)	Contagious
• Salmonella.	Contagious
• Bovine Virus Diarrhoea	Contagious
• Liver fluke	Pasture management
• Schmallenbergvirus	Environment
• Poisoning	Environment/Pasture management
• Lack of minerals, cupper.	Management
• Rumen acidosis	Management
• Mycotoxins (mouldy silage)	Management

4.2 Manure Score assessment: Score 1 Cont'd…

- In exceptional situations, manure score 1 is a bacterial/virus related problem and because of this it is much more difficult to recognize or treat



Bacteria

Virus

A thorough physical check up should be done

5. Manure Score assessment: Score 2

- Score 2: is often associated with lush pasture (more likely at the start of the wet season) or a ration imbalance. If multiple cows within a herd fall under this score, the ration should be re-evaluated
- If only one cow possesses this score, she should be given a thorough physical exam and a veterinarian should be contacted if illness is detected
- Manure score 2 we also see in cows that have just calved, because they may have eaten the placenta

5.1 Manure Score assessment: Score 1 Cont'd…

- Also, first calving heifers in first few weeks after calving because of all kind of hormonal changes produce manure with score 2

- Some real high producing cows, with a high level of concentrates in the ration, have a manure score 2

- Other possible reasons could be:
  - Low fibre in the diet
  - To much concentrate in the diet
  - To much protein in the diet
  - Overcrowding
  - Poor water quality

!!

- If there is no question of one of the above reasons, the cow will have to be examined for possible causes, or the ration will have to be analyzed better to prevent worse

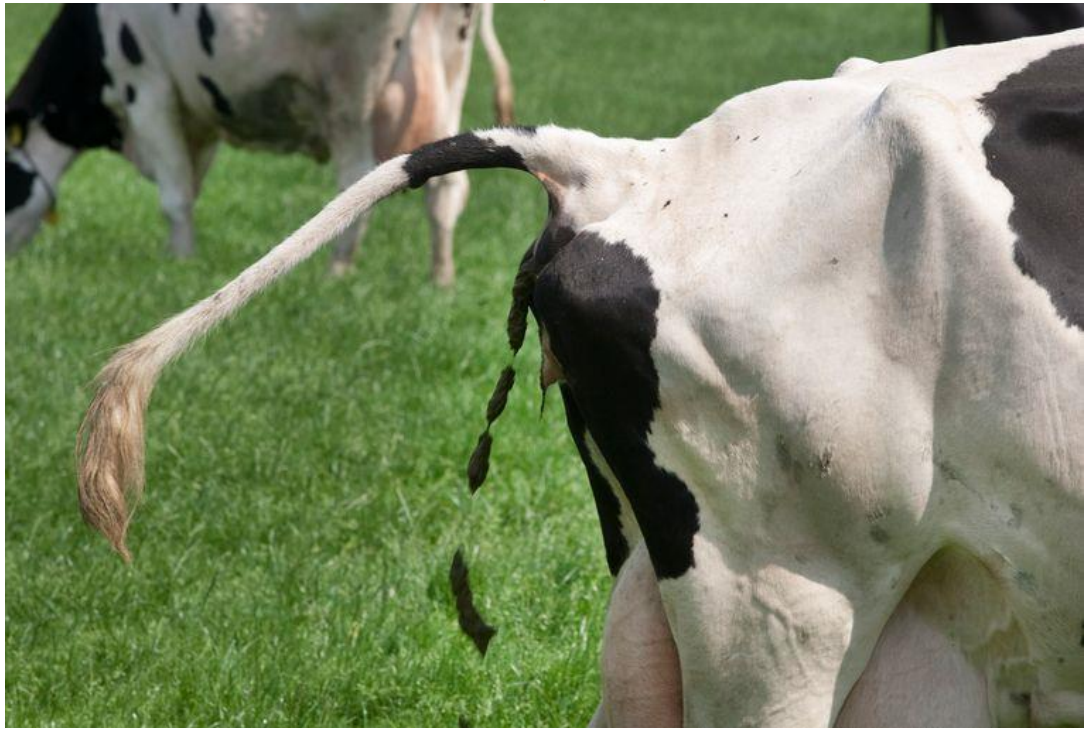
6. Manure Score assessment: Score 3

- Score 3: Is the ideal score for lactating cows with proper ration. They make a well-circumscribed pad that spreads and has a thickness of about 2 cm
- If only one cow possesses this score, she should be given a thorough physical exam and a veterinarian should be contacted if illness is detected
- Manure score 2 we also see in cows that have just calved, because they may have eaten the placenta

6.1 Manure Score assessment: Score 3 Cont'd…

- In general, a manure score in most situations is good
- The digestibility and the passage speed of the feed seems to be quite okay
- In case of disappointing (milk production) results, it is recommended to analyse the manure more in detail

Clean Tail, Clean Udder, Clean thighs (Score 3)



7. Manure Score assessment: Score 4

- Score 4: Is common in heifers and dry cows, but implies an improper ration for lactating cows
- When this kind of manure is seen in a dairy herd, then it is without any doubt that the milk production stays below expectation
- Manure score 2 we also see in cows that have just calved, because they may have eaten the placenta

score 4

7.1 Manure Score assessment: Score 4 Cont'd…

- The food stays to long in the cow, the passage speed is far too low. Energy and protein contents are too low and fibre is far too high

- Other possible reasons include:
  - High fibre
  - Too low energy
  - Too low protein
  - Lack of water

7.2 Manure Score assessment: Score 4 Cont'd…

- Very low water intake can also be a reason of relative high manure score
- Despite all the possible causes, cows generally look healthy (haircoat etc), but heat expression is too low either because of shortage of energy and/or protein

8. Manure Score assessment: Score 5

- Score 5: Is usually representative of a ration imbalance and is seen in dry cows and heifers, quite often in combination with poor asses to water. Cows have difficulties with defecating manure

- It’s the same as score 1,we must try to do everything to avoid having cows and other animals like calves and heifers with this kind of manure.

score 5

8.1 Manure Score assessment: Score 5 Cont'd…

- Manure score 5 shows all kind of shortcomings:
    - Imbalanced ration
    - Poor quality ingredients within the ration
    - Lack of water
    - Wasting a lot energy to pass it through the cow's indigestive system
    - The cow's defecation is accompanied by pain
    - Intestinal system of the cow can be damaged

8. Manure Scoring

- Manure will always tell us everything about a cow's digestion of the ration

- The level of digestion cannot be observed by eye; so manure must be sieved to see how much and what is left

- Before you start sieving the manure, it is important that you let the cows inform you. i.e.:
  - what is their eating behavior?
  - is there selection at the feeding fence?
  - what is the rumination activity, the rumen fill etc?

8.1 Manure Scoring Cont'd…

- Additionally, manure scoring can be an excellent tool to answer such a question as;
  - Are ingredients well utilized?
  - Are water and salt intakes appropriate?
  - Is the ration lacking total or degradable?
  - Is the ration excessive on fibre, protein, or starch?

	Est intake					CP,lb		TDN,lb		Ca,gm		Phos,g	
Requirement, DM/hd/da	24.0					1.85		12.5		25.0		20.0	
			Cost	DM		CP		TDN		Ca		Phos	
Ingredients	$/ton	lb fed	$/da	%	lb	%	lb	%	lb	%	gram	%	gram
Grass hay	60	20	***$0.60***	90.0%	***18.0***	6.5%	***1.17***	51.0%	***9.2***	0.5%	***40.9***	0.2%	***16.3***
Sorghum/sudan hay	50	5	***$0.13***	90.0%	***4.5***	6.5%	***0.29***	49.0%	***2.2***	0.3%	***6.1***	0.1%	***2.0***
20% Protein supp	190	2	***$0.19***	90.0%	***1.8***	20.0%	***0.36***	70.0%	***1.3***	2.0%	***16.3***	1.0%	***8.2***
Total		27.0	***$0.92***		***24.3***		***1.82***		***12.6***		***63.3***		***26.6***
Def/excess					0.3		0.0		0.1		38.3		6.6

The manure will tell you if the calculation was correct!

9. Judging criteria for manure

1) Manure Consistency

- Manure with dark-colored clay plugs indicates a rapid passage of digestible, low fiber roughage
- Solid manure with a slime layer indicates a slow passage

2) Smell of the manure

- Manure should always be odorless. Sharp tingling smell is a sign of high urea in the milk
- A sharp acid smell, the cow most probably is suffering of acidosis

9.1 Judging criteria for manure Cont'd…

3) Colour of the manure

- The colour of the manure gives an indication about the level of protein it still contains
- The lighter the manure the lower the protein. Shiny and thin manure indicates an overdoses of fast degradable sugars

Low protein ration?

10. Sieve out the manure

- In case visual assessment of the manure does not give the information you are looking, for then it is time to sieve out the manure and find out what is in.

  - Step 1; put the sample in the sieve, add some water.

  - Step 2; keep adding water very slowly and keep stirring. Continue till all the liquids are sieved out

10.1 Sieve out the manure Cont'd…

- Step 3; All the liquids are sieved out, only fibres are left

- Step 4; Spread it out and start analysis

10.1 Analysis of the sieved-out manure Sample

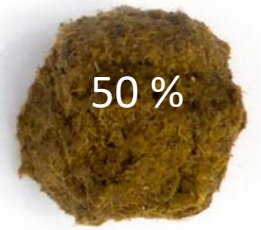
- What do we see?

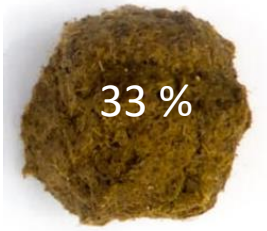
    1. Undigested fibre
    2. Un-digestible fibre
    3. Whole seeds (cereals ,corn)

10.2 Conclusions from the sieved-out manure Sample

- First conclusions can be made:

When left overs are more than 33% , and fibre looks fine, it means that the cow's rumination activity is rather good but the fermentation is too slow. The food is not digested enough and the amount of fibre in the manure is too much.





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