

Acidosis due to Overfeeding

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ABSTRACT

Overfeeding is not good for animals even when our intentions are pure. It can have unfavorable effects on our beloved animal or pet. As an effect of overfeeding, severe health problems may occur. The plenty of appealing delicacies and rich dishes during Eid can root a challenge when it comes to portion control and maintaining a balanced diet for our animals. As most of us don't know the portion control of the diet of the animal, we feed a lot of carbohydrates to the animal which results in many problems. Digestive issues, metabolic issues and mainly obesity are the costs of overfeeding. Overfeeding leads to excessive weight gain. This gain in the weight can cause other secondary problems to the health of the animal including heart problems and joints problem. Animal may become reluctant to walk due to over-weight.

Introduction

Overfeeding is not good for animals even when our intentions are pure. It can have unfavorable effects on our beloved animal or pet. As an effect of overfeeding, severe health problems may occur. The plenty of appealing delicacies and rich dishes during Eid can root a challenge when it comes to portion control and maintaining a balanced diet for our animals. As most of us don't know the portion control of the diet of the animal, we feed a lot of carbohydrates to the animal which results in many problems. Digestive issues, metabolic issues and mainly obesity are the costs of overfeeding. Overfeeding leads to excessive weight gain. This gain in the weight can cause other secondary problems to the health of the animal including heart problems and joints problem. Animal may become reluctant to walk due to over-weight [1].

Effects of overfeeding

Effects of overfeeding varies from mild to severe health problems. Some of the effects of overfeeding are given as follows:

1. Digestive problems
2. Obesity
3. Metabolic disorder
4. Joints problems
5. Hormonal disturbances
6. Exercise intolerance
7. Heart problems
8. Respiratory issues
9. Loss of body stamina
10. Reduced performance [2]

Acidosis

Acidosis is a common metabolic disorder which is caused by the imbalance of acid- base equilibrium in the rumen of the animal. This imbalance results in the decrease of pH of rumen. Digestive system of the ruminants has a unique property to ferment the herbal material in their rumen. This is also known as a large fermenting chamber of the ruminants. Healthy rumen produces volatile fatty acids (VFAs) as a result of fermentation. Primarily it produces propionate, acetate and butyrate, which all are absorbed in the body and animals use it as a source of energy. pH of the rumen normally ranges from 6.0 to 7.0. This range of pH is ideal for the normal growth of microbial population which is responsible for the fermentation process. When the pH of rumen falls below 6.0, acidosis happens. This occurs as a result of eating too much carbohydrates or grains. When the pH falls, the normal living bacteria in the rumen get killed. Acidosis occurs due to poor management factors and certain dietary issues [3].

Types of Acidosis

There are primarily two types of acidosis seen in ruminants:

1. Acute Ruminal Acidosis (ARA)

When animals eat a large amount of the feed containing high fermentable carbohydrates like grains in a shorter period of time, acute ruminal acidosis occurs. Acute form of ruminal acidosis is a quick developing condition and it is a very severe problem in most of the ruminants. Rapid accumulation of lactic acid and volatile fatty acids (VFAs) occurs when sudden entry of easily digestible carbohydrates in the body. Buffering capacity of the rumen is stunned by the excessive production of these acids which will lead to a significant fall in pH of the rumen. Clinical signs and symptoms vary from mild to severe including reduced feed intake, dehydration, diarrhea, depression and lameness. Severe cases may be fatal for some animals [4].

2. Subacute Ruminal Acidosis (SARA)

Subacute ruminal acidosis is a milder form of acidosis that occurs when ruminants consume moderately fermentable carbohydrates in their diet. In this case, the rumen pH remains below the optimal range for long periods of time, resulting in poor rumen function and microbial imbalance. Feeding high-grain diets or diets with an imbalanced fiber-to-starch ratio can cause this.

Subacute ruminal acidosis symptoms may be more subtle and less severe than acute acidosis symptoms. Animals that are affected may have mildly reduced feed intake, decreased milk production, weight loss, and occasional bouts of diarrhea. Furthermore, subacute acidosis is frequently linked to an increased risk of laminitis, a painful and debilitating condition of the hooves.

ARA and SARA can both be harmful to rumen health, nutrient utilization, animal performance, and overall well-being. They can result in decreased feed intake, decreased milk production, weight loss, digestive upsets, metabolic disorders, and an increased risk of laminitis (a painful hoof condition) [5].

Treatment

Following treatment would be most effective in case of acidosis:

1. **Fluid Therapy:** For dehydration and electrolyte imbalance
2. **Alkalinizing Agents:** To increase ruminal pH. Alkalinizing agents mostly used are magnesium oxide and sodium bicarbonate.
3. **Slow Transition to a High-Fiber Diet:** To restore ruminal health
4. **Probiotics and Yeast Supplementation:** To aid the digestion process and to restore the healthy microbial population. This also helps in the utilization of nutrients.

5. **Anti-inflammatory Medications:** Nonsteroidal anti-inflammatory drugs (NSAIDs) used to relief pain and inflammation.
6. **Management Changes:** To prevent further acidosis [6].

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Treatment	Dose Rate (per animal)	[7]
Sodium bicarbonate	1-2 grams per kilogram of body weight	
Magnesium oxide	0.25-0.5 grams per kilogram of body weight	
Calcium carbonate	0.5-1 gram per kilogram of body weight	
Water	Ad lib	
Feeding hay or straw	Ad lib	
Stopping concentrate feeding	for 24-48 hours	
Treating underlying causes	Yes	

Control and Prevention

There are several things that can be done to prevent acidosis, including:

- Gradually introducing grain into the diet. This allows the rumen microbes to adjust to the change in diet and prevents a sudden buildup of acids.
- Providing a lot of forage. Forage contains fiber, which helps to buffer acids in the rumen.
- Do not feed large amounts of grain at once. This can overwhelm the rumen microbes and cause acid buildup.
- Make sure the animals have constant access to clean, fresh water. Water aids in the diluting of acids in the rumen.
- Take your time transitioning to a high-grain diet. This includes gradually increasing the amount of grain in the diet over several weeks and providing plenty of forage throughout the transition.
- Keep an eye on the pH of the rumen. A rumen pH probe can be used for this. The pH of a healthy rumen is usually between 5.8 and 7.2.
- Use buffers. Buffers can help to neutralize the acids in the rumen. Sodium bicarbonate, magnesium oxide, and calcium carbonate are all examples of common buffers.

If acidosis does occur, it is critical to seek veterinary care as soon as possible. Early treatment can help to avoid serious complications [8],[9].

Conclusion

Acidosis is a serious condition that can be avoided with careful dietary management. If acidosis develops, it is critical to seek veterinary care as soon as possible.

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