ANKARA UNIVERSITY
FACULTY OF VETERINARY MEDICINE
ANIMAL DISEASE AND NUTRITIONAL DISEASES

# NUTRITIONAL DISEASES IN RUMINANTS

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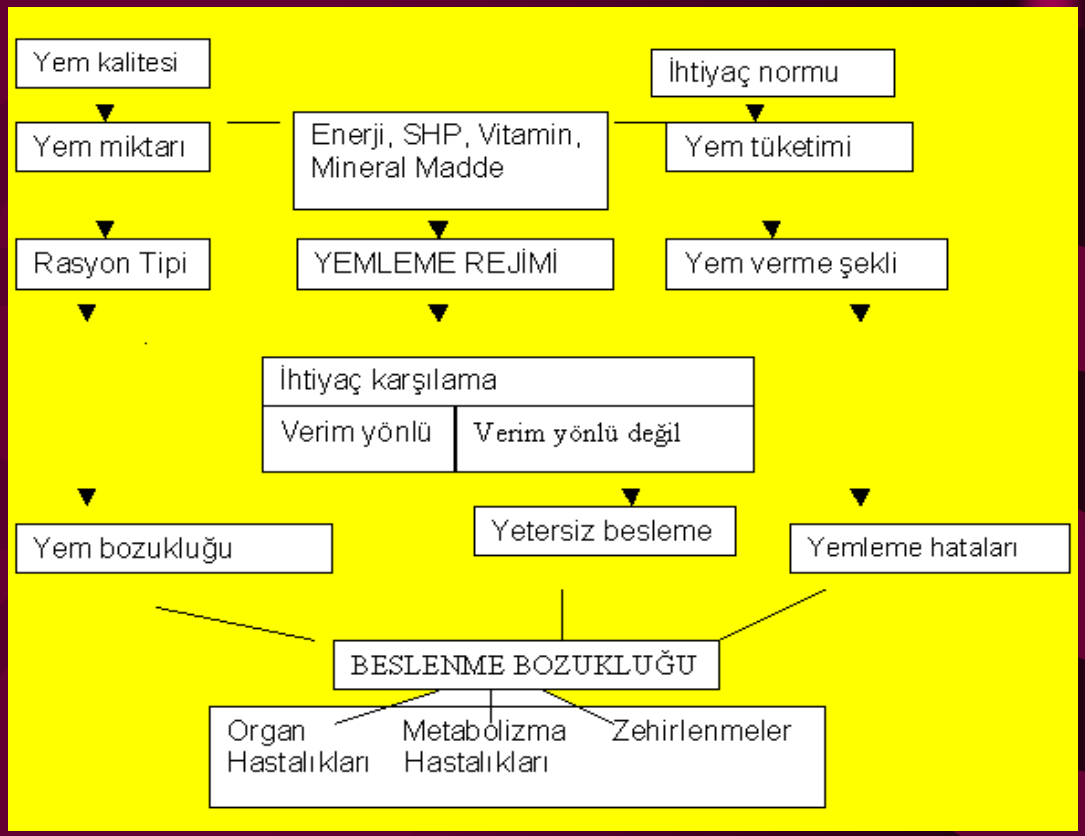
# Yemleme programı ve sağlık bozuklukları arasındaki ilişki

-Inadequate feed or energy and nutrient intake,
-Insufficiency of feed quality,
-Misuse of requirements norms,
causes lack of energy and essential substances in animals.
This is referred to as "NUTRITIONAL DEFICIENCY".

*The quality of feedstuff and feed deficiencies are closely related.
*The structure of feed substances and organ diseases are closely related.
Health disorders due to incorrect feeding are expressed as FEEDING ERRORS.
Insufficient feeding + feed disturbances + feeding errors = "NUTRITION DISORDER"



- Relationship between feeding program and health disorders
- The cell wall of the feedstuff is the
- "Crude cellulose":
- 1. stomach-intestinal channel in the motor functions,
- 2. In the case of obstruction of discharge and oppression,
- 3. plays a role large intestinal contents and water absorption.
- 4. It has a gripping function and serves to remove harmful degradation products with feces.

# Energy and Nutrient Phases and Inadequacy Observed Disorders

# ACİDOSİS
## (Lactic acidosis)

- Acute acidosis occurs when the pH value of the rumen falls below 5.5.
- The pH value of the rumen content should normally be between 5.8-6.2 /6.4-6.8.
- Feeds rich in easily soluble carbohydrates (especially wheatgrass) quickly ferment in the rumen.
- These feeds are deficient in cellulose, which is necessary for adequate chewing activation.

# Acidosis in cattle

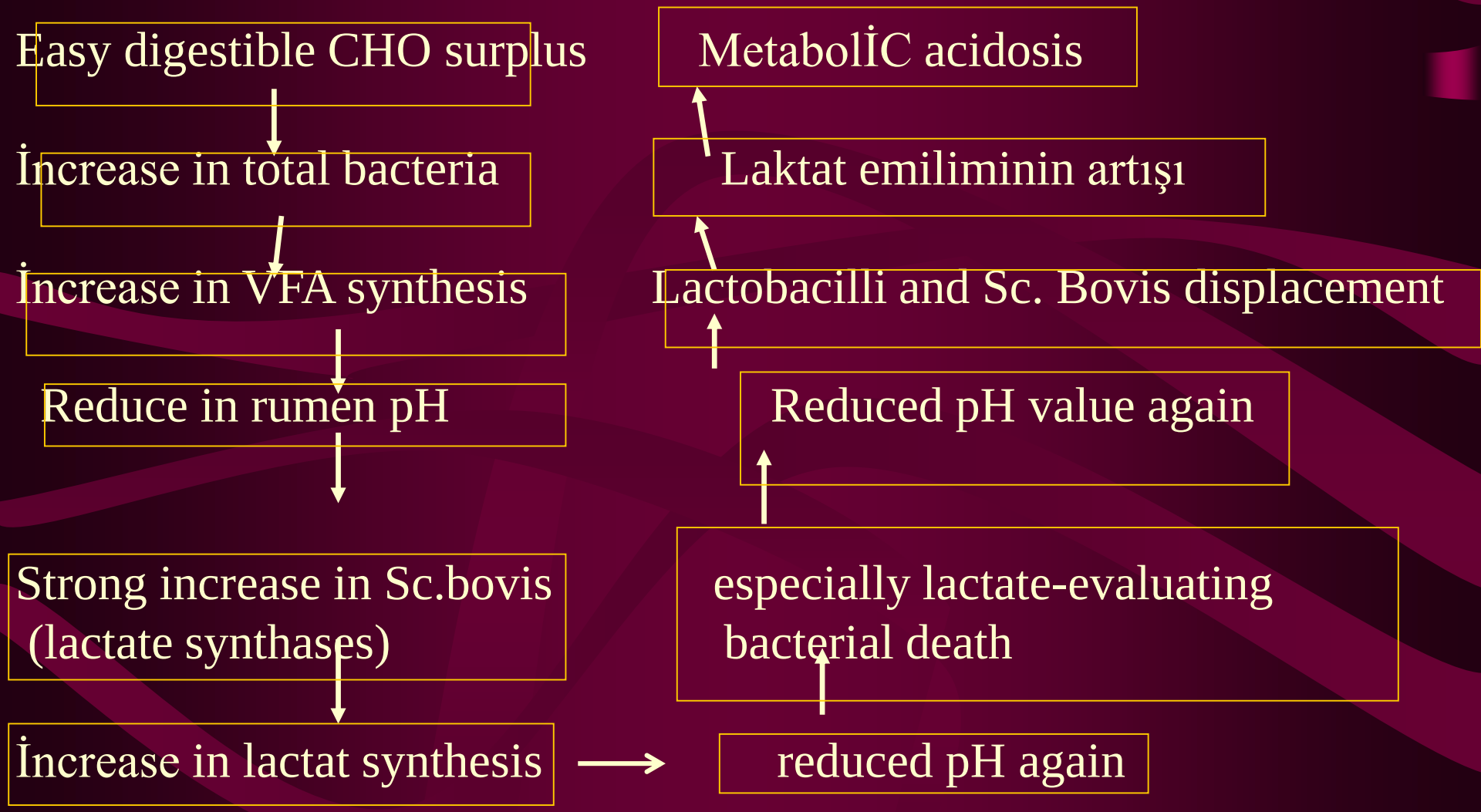
❖ **Etiyology**

- Rumen acidosis may be associated with laminitis.

- Carbohydrate feeds that can be easily fermented in extreme quantities are fed to ruminants unilaterally, the ration HS levels are low, resulting in increased ruminal lactic acid microorganisms and lowering the pH to 5.4-5.2 and L. acid.

- Rumen de lactic A. microorganisms (such as St.Bovis, lactobacillus supp., Butyrivibrio fibrisolvens) multiply.

# Rumen flora reaction chain in acute rumen acidosis (NOCEK,1996)



# Characteristics of rumen bacteria in different KHO sources (Hutjens, 1997)

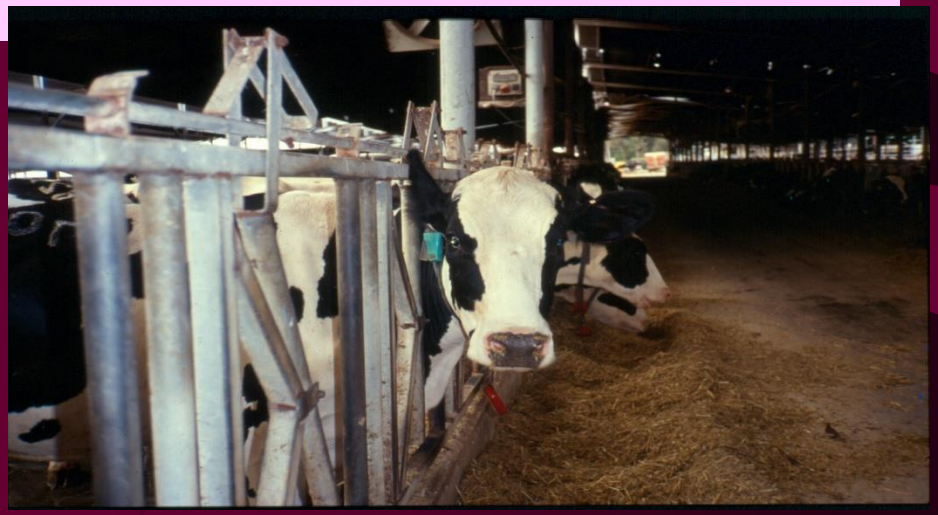
| Bacteria | CHO source | N-requirement | VFA | pH | Double the population |
|---|---|---|---|---|---|
| **Cellulolytic bacteria** | **Cellulose hemicellulose** | **NH4** | **Asetat Bütirat** | **6.0-6.8** | **8-10 h** |
| ***Starch and sugar breakers*** | ***Candy Starch*** | ***NH4 A. acids*** | ***propionate lactate*** | ***5.5-6.0*** | |

# ACIDOSIS

- It occurs with high amounts of animals that are not accustomed to grain grains, and in a short time with these grains.
- Sudden ration change occurs when feeding faults and concentrated feeds are suddenly consumed.

**Rapid increase in the amount of concentrated feed.**
**Unbalance of ratio of coarse feed / concentrated feed.**
**Rough feed fiber inadequacy.**

- Clinical signs are mostly gray-brown, foamy stools, anal region and tail contaminated from this fecal matter.
- Acidosis also causes diseases such as nail inflammation, laminitis, rumenitis, liver abscess, polyencephalomalacia and foot rot.



# Subclinical Ruminal Asidosis

- Incorrect CHF feeding, overdose of sugar, starch consumption, low ration HS level reduces the ruminal pH value to below 5.5.
- In addition, the climate and shelter are also effective in the formation of subclinical ruminal acidosis.
- Stool in the stool, air bubbles are observed with untreated stools. When a piece of water is poured over the stool, the untrimmed stalks on the sieve are clearly visible.

# Subclinical Ruminal Asidosis

- In addition, undigested and undigested long fibers from the rumen are also observed.
- The excess acid that is released by the microorganisms found in the thick digestive glands and used for the formation of gas and acid by this microorganisms damages the intestinal mucosa and is excreted through the mucous membrane.
- Stool should be short, long roughage, no mucosa.

# SYMPTOMS

- A gray-gray foamy stool is visible.
- In feces, undigested granules, undigested fibers, mucosa are visible.
- Roman movements are reduced.
- Feed consumption stops and yield decreases.
- Your heart rate increases.
- Severe diarrhea.
- Rumende rumbling and gas accumulation.
- Laminitis, rumenitis, liver abscess, polyencephalomalacia, foot rot.

- **High concentrate feed consumption:**

- Nail diseases and health problems are increasing, decreasing rate of utilization of feed and efficiency performance are observed.

- **In cases of mild illness;**
- Temporary loss of appetite,
- Decrease in Rume motility,
- Drop in milk yield,
- Changes in color and consistency of Gaita can be observed.

- **In moderate** cases;

- Animal food and water consumption stops.
- Sudden decreases in milk yield occur.
- Signs such as stagnation of animals, reluctance to behave, persistent desire to sleep, moaning, teeth creep may occur.

- In some cases, restlessness, pain, and nervous symptoms can be observed in animals.

- **In severe cases**, animals entering the coma in a short period of time are placed in a lying position. Deaths occur in untreated animals.

# PROTECTED

- The disease can be prevented by mixing the feeds well, making gradual changes in the ration and passing slowly through the concentrate.
- Rough and concentrated feed should be given together. Feeds should be given in small portions frequently.
- NDF should be present in the dry matter at a rate of 28-36%.
- The consumed particles should not be thin, long and thick.
- Excessively concentrated feed should not be given and the exercise period should be applied.
- The concentrate is added to 1.0%, 5% NaHCO3 in water.
- The roughage rate in the area should not be less than 10%.
- Rationa can participate in ionophore antibiotics.

# Metabolic Acidosis

- Acute suddenly occurs in excess of carbohydrate.
- Chronicly, excess carbohydrates are seen in sheep that receive low-forage feed.
- It occurs 12 to 36 hours after feed consumption.

# Metabolic Acidosis

- Fermentation endotoxins formed by a large number of gram (-) microorganisms occur.
- With the breakdown of proteinaceous substances, histamine, tyramine is released: laminitis, lameness, nail disorders occur.
- Rumen wall is destroyed, abscess and necrosis develop in the liver.
- Rumen is shaped as stasis.
- The acid and base balance of the body breaks down.
- The alkaline reserve of the blood is reduced and metabolic acidosis occurs.

- İn blood

1. Glucose, urea and hemoglobin values increase, calcium,
2. magnesium and inorganic phosphorus values decrease,
3. total bilirubin increases.

As the amount of urine decreases, the specific gravity decreases and becomes acidic.

- Clinical manifestations are seen at 12 to 36 hours after unusual consumption of feed in excess amount.
- The first finding is incoordination and ataxia.
- Reluctance is seen in feed, appetite diminishes and stops.
- The performance of the animal is low. Laminitis is formed.

- Rumen content takes the consistency of dough, abdominal pain and diarrhea occurs.
- Pulse and breathing increase,
- Eyes collapsed into the eye socket.
- Skin elasticity disappears within 24-48 hours.
- The teeth consist of squeaking, groaning, grief, and the animal is laid down, cannot get rid of the coma and death.
- After the acute phase, pups can be seen.

# Treatment of metabolic acidosis

- Patients with mild symptoms may recover without treatment.
- 1. Rumen is evacuated and rumen fluid of the intact animal is given.
- Rumen fluid of healthy animal can be given 2-3 l / day. This application can continue for 2-3 days according to the condition of the animal.
- In the meantime, antacids (Mg CO3, Mg (OH) 2 and CaCO3) are given.
- In addition, 1-2 liters of warm water can be applied in 6-12 hours

- 2. High level of antibiotics to prevent the growth of lactic acid-producing microorganisms
- peniciline, tetracycline is applied.
- 100 g of bread is given to the animal.
- Ionophore antibiotic application is useful. For this, monensin and salinomycine are given.

- 3. NaHCO3 solution to provide acid and base balance at iv. or probe.
  Physiologically saline isotonic bicarbonate with left. infusion.
  calcium gluconate and vitamin B1, methylene blue may be applied to increase the tone of skeletal and rumen muscles.
  4. Antihistamines are given intra muscular and injected into cortical steroids to prevent intoxication.
  5. The amount of ration to be consumed is reduced and very good quality dry grass is given.

# ✓Clinical findings

- ✓ The most common symptoms are gray-brown, foamed feces, anal region and tail contamination, clinical signs of acidosis.
- ✓ Symptoms such as decreased rumen movements, stopping of feed consumption, increased heart rate, severe diarrhea, and rumen accumulation of gas in the rumen are also observed.
- ✓ This phenomenon also causes diseases such as laminitis, rumenitis, liver abscess, polyencephalomalacia and foot decay.

# Disease Symptoms

| | Akut-klinik | Kronik-subklinik |
|---|---|---|
| Rumen pH | <5.1 | <5.5 |
| Acids | Laktik A. | VFA |
| Rumenitis | Evet(+) | Yok? |
| Liver abscess | | Yok |
| Laminitis | | Belki |
| Feed intake | Aniden düşer | Dalgalı |

Rumen florası gram (+) pozitif gram (- )hakim

# Symptoms

- Internship and ataxia
- Feed consumption decreases, appetite decreases or stops
- Romanian movements and fermentation stops
- Laminitis, lameness, nail disorders
- Romanian content takes the consistency of dough
- Abdominal pain and diarrhea are seen
- Rumen wall destroyed, abscess and necrosis develop in liver
- Pulse and breathing increase, eyes pits
- Skin loses elasticity (24-48 hours)
- Tooth squeaking, groaning, painful
- The animal cannot get up, coma and death are seen
- Abort can be seen

# TEDAVİ-Treatment

- In mild cases the animal can heal without treatment
- Rumen fluid is evacuated and healthy animal is given, 2-3L / day
- In addition, anti-acids, (Ca-carbonate, mg-carbonate, mg-oxide) can be given.
- High levels of antibiotics are given. Ionophore antibiotics are helpful.
- NaHCO3, Antihistamines, i.m., cortical steroids Inject.
- The amount of ration is reduced and quality herb is given.
- Mixed feed is reduced, roughage is increased

# COMPOSITION OF CATTLE FECES

| Composition | % |
|---|---|
| Water | 79 |
| Dry matter | 21 |
| | % (at DM) |
| Nitrogen | 2.3 |
| Phoshpor | 1.1 |
| Kalium | 2.9 |

# Protection -Koruma

- Combination of coarse and concentrated feeds to animals (total ration) or
  Feeding in small portions throughout the day reduces the risk of acidosis.
  To prevent acidosis, 28-35% NDF should be present in the dry ration.
  75% of NDF should be provided from fresh roughages.
  The consumed particles should be thin, not too long and thick, medium size.
  Excessive concentrate feed should be avoided and should be given by exercise.
  Concentrated eating transition from coarse feed should be 10-12 days.
  NaHCO3 should be added with a concentration of 1.0%.
  The rate of roughage should not be less than 10%.
  Rationally, ionophores such as monensin, lasolisid, salineomsin are added.

In order to prevent this situation, 28-35% NDF should be present in the ration dry matter.

Symptoms:

anorexia, severe digestive disorder, rumen atony, nervous symptoms,

Breath smell aromatic sweet,

urine examination

It is observed intensively at the lactation peak.

Solution: Avoid feeding with butyric acid or degraded silage..

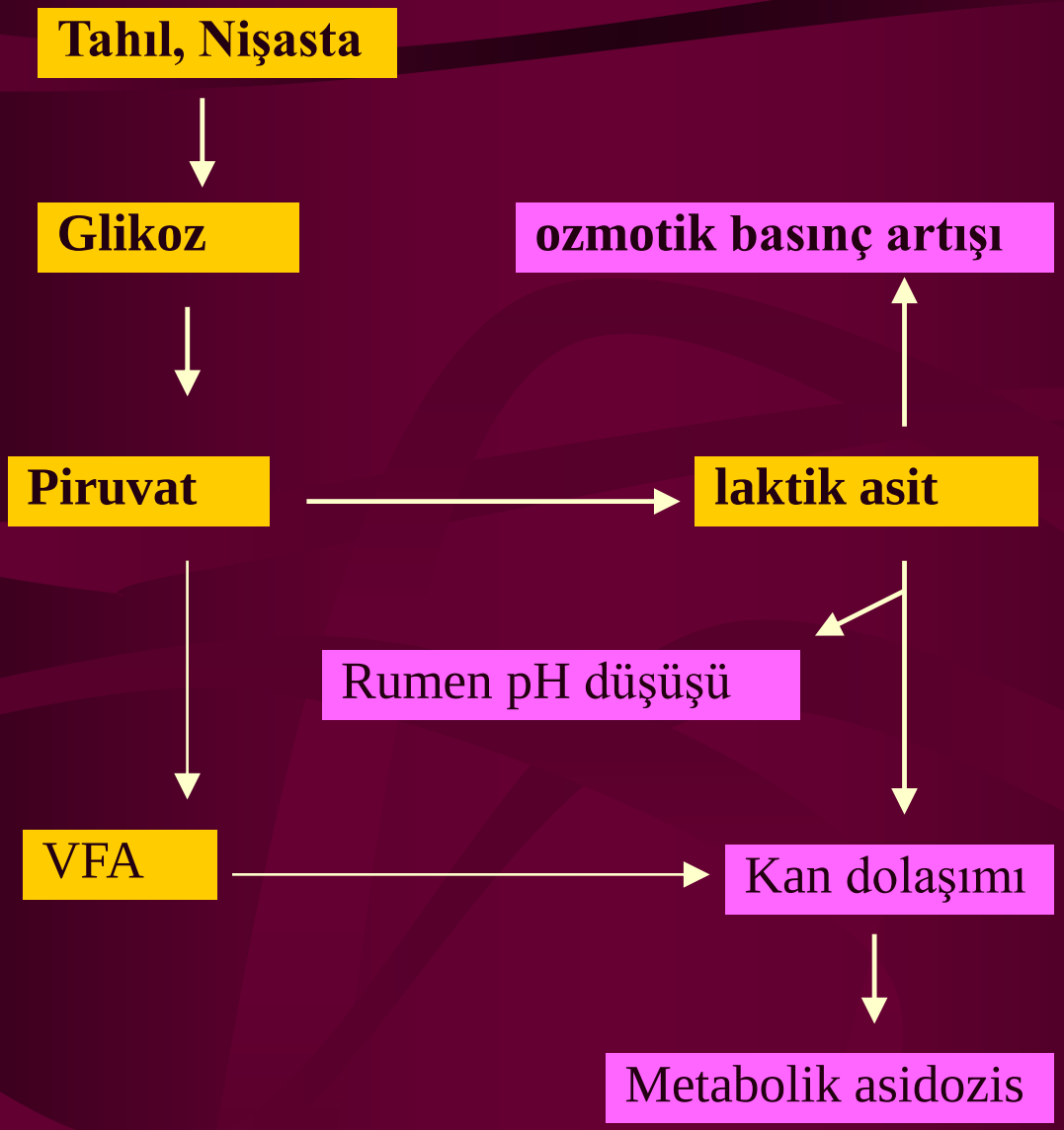
# LOWER ROUGH FEED QUANTITY TO BE GIVEN TO ANIMALS FOR THE REGULAR OPERATION OF THE DIGESTIVE SYSTEM

| Animal Type | kg/d (% 87 DM) |
|---|---|
| Dairy Cow | 5.5 – 7.0 |
| Beef cattle, dry cow | 2.0 – 2.5 |
| Young cattle (1 aged) and calves | 1.5 |
| Paddock fattening | 1.5 |
| Sheep (all ages) | 0.3 |
| Sheep (lactation)) | 1.4 |

# ACIDOSIS
## (Lactic acidosis)

- Acute acidosis occurs when the pH value of the rumen falls below 5.5.
- The pH value of the rumen content should normally be between 5.8-6.2 /6.4-6.8.
- Feeds rich in easily soluble carbohydrates (especially wheatgrass) quickly ferment in the rumen.
- - These feeds are deficient in cellulose, which is necessary for adequate chewing activation.

- Asidosis in cows
- Etiology
- Rumen acidosis may be associated with laminitis.
- Carbohydrate feeds that can be easily fermented in extreme quantities are fed to ruminants unilaterally, the ration HS levels are low, resulting in increased ruminal lactic acid microorganisms and lowering the pH to 5.4-5.2 and L. acid.
- Rumende lactic A. microorganisms (such as St.Bovis, lactobacillus supp., Butyrivibrio fibrisolvens) multiply.


Tahıl, Nişasta
Glikoz
ozmotik basınç artışı
Piruvat
laktik asit
Rumen pH düşüşü
VFA
Kan dolaşımı
Metabolik asidozis

# clinical symptoms

Clinical signs are mostly gray-brown, foamy stools, anal region and tail contaminated from this fecal matter.

Acidosis also causes diseases such as nail inflammation, laminitis, rumenitis, liver abscess, polyencephalomalacia and foot rot.

Subclinical Ruminal Asidosis

Incorrect CHF feeding, overdose of sugar, starch consumption, low ration HS level reduces the ruminal pH value to below 5.5. In addition, the climate and shelter are also effective in the formation of subclinical ruminal acidosis.
Stool in the stool, air bubbles are observed with untreated stools.
When a piece of water is poured over the stool, the untrimmed stalks are clearly visible on the sieve.

- Subclinical Ruminal Asidosis
- In addition, undigested and undigested long fibers from the rumen are also observed.
- The excess acid that is released by the microorganisms found in the thick digestive glands and used for the formation of gas and acid by this microorganisms damages the intestinal mucosa and is excreted through the mucous membrane.
- Stool should be short, long roughage, no mucosa.

- symptoms
- A gray-gray foamy stool is visible
- In feces, undigested granules, undigested fibers, mucous membranes
- Romanian movements are reduced
- Feed consumption stops and yield drops
- Heart rate increases
- Severe diarrhea
- Rumende rumbling and gas accumulation
- Laminitis, rumenitis, liver abscess, polyencephalomalacia, foot rot
- High concentrate feed consumption:
- - nail diseases and health problems are increasing
- - decline in the rate of utilization of feed and yield performance.

- In mild cases
- - temporary decrease in appetite,
- - reduction in rumen movements,
- - drop in milk yield,

- - Changes in gaita color and consistency can be observed.
- In moderate episodes
- - Animal food and water consumption stops.
- - Sudden decreases in milk yield.
- - Signs such as stagnation of the animals, reluctance to behave, constant desire to sleep, moaning, teeth creaking may occur.
- - In some cases, restlessness, pain and nervous symptoms can be observed in animals.
- In severe cases,
- - animals entering the coma in a short time will be placed in a horizontal position.
- Deaths occur in untreated animals.

# PROTECTION

- The disease can be prevented by mixing the feeds well, making gradual changes in the ration and passing slowly through the concentrate.
- Rough and concentrated feed should be given together
- Feeds should be given in small portions frequently
- NDF must be present in the dry matter at a rate of 28-36%
- Consumed particles should not be thin, long Concentrated feed should not be given and exercise period should be applied
- Concentrated diet is added 1.0%, 5% NaHCO3 in water
- The roughage rate in the area should not be less than 10%.
- Rationa can participate in ionophore antibiotics.

- Metabolic acidosis
- Acute overdose occurs when KH is given suddenly
- Chronicly, excess KH is seen in sheep receiving low-forage feed
- Visible after 12-36 hours of feed consumption
- Many fermentation endotoxins formed by grams (-) mo.
- - With the breakdown of proteinaceous substances, histamine, tyramine is released: laminitis, lameness, nail disorders occur.
- - The Romanium wall is destroyed, abscess and necrosis develop in the liver.
- - Rumende stasis shaped.
- - The acid and base balance of the body breaks down.
- - The alkaline reserve of the blood is reduced and metabolic acidosis occurs.

- Blood
- 1. increase glucose, urea and hemoglobin values,
- 2. Calcium, magnesium and inorganic phosphorus values are reduced,
- 3. the total amount of bilirubin increases.

- As the amount of urine decreases, the specific gravity decreases and becomes acidic.
  Clinical manifestations are seen at 12 to 36 hours after unusual consumption of feed.θ
  The first finding is incoordination and ataxia.θ
  Reluctance is seen in feed, appetite diminishes and stops.θ The performance of the animal is low.
  laminitis is formed.θ
  Rumen contents consist of dough consistency, abdominal pain and diarrhea.θ

- Increased pulse and respiration,θ
  Eyes drown in the pit.θ
  Skin elasticity disappears within 24-48 hours.θ
  Tooth grinding, groaning, pain, and the animal lays down, and the result is coma and death.θ
  Puppies can be seen after acute phase.θ
  Treatment of Metabolic Acidosis
  Mild cases can heal without treatment.¬

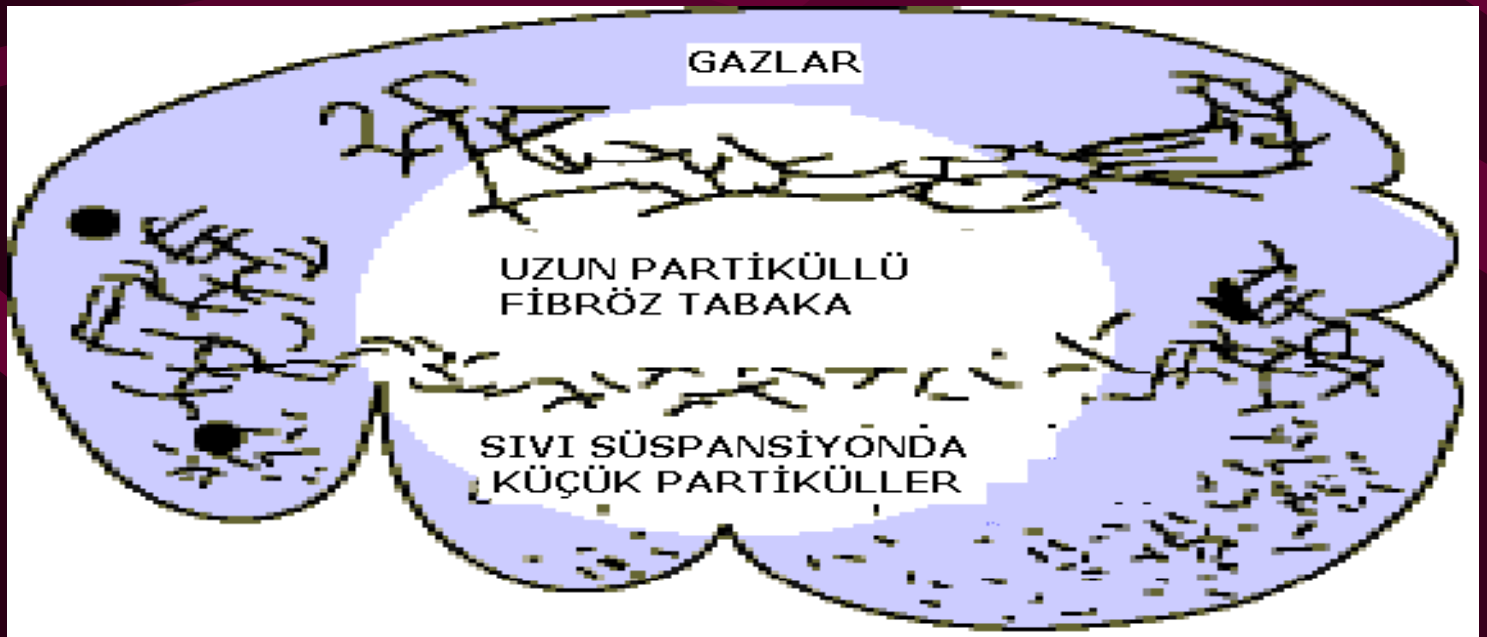
- 1. The rumen is emptied and the rumen fluid of the intact animal is given.
  Healthy animal rumen fluid can be given 2-3 l / day.) This application may last 2-3 days depending on the condition of the animal.
  In the meantime 20-30 g of antacids (MgCO3, Mg (OH) 2 and CaCO3) are given.)
  In addition, 1-2 liters of warm water can be applied between 6-12 hours.)

- 2. High levels of antibiotics to prevent the reproduction of lactic acid producing microorganisms
- penicillin, tetracycline.
- 100 g of bread is given to the animal.
- Application of ionophore antibiotics is beneficial. For this, monensin and salinomycine are given.

- 3. NaHCO3 solution to provide acid and base balance iv 5% iv. is applied with a catheter.
- Physiological saline with isotonic bicarbonate left. may be given as infusion.
- calcium gluconate and vitamin B1, methylene blue can be applied to increase tonus of skeletal and ruminal muscles.
- 4. Antihistamines are given intra-muscular and cortical steroids are injected to prevent intoxication.
- Reduction of the amount of ration given on time, very good quality weed is given.

# TIMPANI

- It is characterized by excessive gas accumulation in rumen.
- The Romanian content normally consists of 3 layers.
- -The liquid layer in the lower part,
- solid structure in the middle,
- at the top, there is a gas layer.



# etiology

- Instant feed changes,
- excessive concentrate feed consumption,
- insufficient roughage intake,
- very finely ground baits,
- fresh legumes
- abdominal pressure increases and free gas accumulation in the rumen is observed. Normally, the gases formed are lost by belching.
- Timpani occurs when the gas is blocked from the rumen for any reason.
- Generally “Timpani ve is observed when the ratio between rough feed and concentrated feed dry matter is very narrow.
- The consumption of legumes such as clover, lime and clover, which are rich in water, in extreme amounts, causes foaming and acute tympanics.

- If more than 50% of the Ration DM consists of concentrated feeds, more gas is produced.

The obstruction of the esophagus with feed and the ingestion of the pharynx with feed or hair

especially young, lignin-poor green baits, clover and alfalfa grasses cause foamy gas formation. saponin (including surface activity) forms timpani with foams containing many small gas bubbles.

This is especially the highest between pH 4.4-5.5.

- In most swelling, the rumen pH is 5.2-6.0.

A high rate of salivation prevents the formation of foam.
Consumption of poor green feeds in terms of DM and HS regresses saliva secretion because chewing and ruminating are less.
Rations with small particles and concentrated feed concentrate feeds increase the formation of small foamy fermentation.

# Clinical findings

- Gas formation Gaz. Rumen pressure makes diaphragm.
- ile with pressure to the lungs. breathing becomes hard
- Death is observed in acute cases.
- Abdominal left-upper side, bilateral cases of severe swelling

- Fast, inaccurate milk or excessive consumption of milk in suckling calves and lambs
- cardia
- Omasum clogging of calves due to consumption of ground lignin and grinded roughages
- In calves, in the 3rd week of life, excessive amounts of long-fiber, low-energy feed can cause chronic gas accumulation.

- In calves above eight weeks of age and in lambs over 3 weeks of age, coarse feed consumption, which is smaller than 6 mm in size, often leads to gas formation.
- Crushed barley, which was added to the ration along with dairy calves, gave good results in timpani prophylaxis.

# Treatment

- animals are executed, rumene puncture is performed
- Ionophore antibiotics
- In acute cases, the gas is taken out through the trocar.

# ABOMASUM REPLACEMENT

- In cattle, the abomasum is stretched by the action of gas, liquid or both and taking an abnormal position.
- Abomasum usually moves to the left and up and comes between the rumen and the left side of the abdominal wall.
- often occurs within two weeks of calving. conditions related to calving can create predisposition.
- In the late stages of pregnancy, excessive amounts of concentrated feed to the cows in the dry cows or to the dairy cows during the calving period increases the occurrence of the disease.

- The symptoms are similar to the symptoms of ketosis.
- stopping or cutting feed consumption,
- limited bowel movement,
- normal body temperature,
- decreased milk yield,
- weakness and discomfort occur.

- The symptoms observed in the non-generalized right-sided abomasum are slightly different.

# POISONING
# Feeding poisoning

| Disease | Animal | Why is that | prophylaxis |
|---|---|---|---|
| NPN (NH3) poisoning | Cattle, sheep | Excessive NPN consumption | Adherence to the NPN recommendations |
| Nitrate / Nitrite poisoning | Cattle, sheep | Nitrate / nitrite containing feed consumption | Control of nitrate / nitrite feed consumption |
| Copper poisoning | Calf, lamb | More than 12 ppm Cu in KM | Non-toxic Cu increase in ration |
| Salt ration | Winged | Excessive salt consumption | NaCl level control |
| Water Toxication | Calf | Excessive water consumption after milk cutting and dehydration for a long time | Giving a certain amount of water |
| Bacterial deterioration disease | All animals | Bacterial toxins in spoiled feed (toxic amine, lipopolysaccharide) | Avoid bacterial spoiled feed, feed should be given after heating sufficiently |
| Mycotoxicoses | “ “ | Mushrooms and toxins | Avoid micological spoiled feed |
| | | | |

# 1. WATER TOXIC

- Suddenly, excessive water consumption is caused by the deterioration of the osmotic balance.
- It can be observed in calves at 2 months.
- diarrhea, paralysis, muscular tremor, coordination disorder and edema occur.
- The free water consumption of the sick animals should be prevented and physiological saline should be given as liquid (2-3 l in 5% solution, 300 ml 10% solution in heavy venous venous solution).

# Ammonia poisoning (urea poisoning)

- Urea:
- to participate in more than ration,
- consuming well without mixing,
- high amounts of exercise
- the absence of an adequate amount of easy-to-assessable energy sources in the ration is effective.
- Urea, ammonia and carbon dioxide are decomposed by urease.

- Increased ammonia and pH value in the rumen increases the absorption of ammonia, the portal comes to the liver through the pathway where the toxic effect is removed by turning to urea.

  Ammonia growth above the capacity to detoxify the ammonia into the liver increases the level of ammonia, normally 1 mg / l, to 6 mg / l. Symptoms such as respiratory, feed consumption disorders, increase in saliva secretion, impaired rumen motor function, tremor in the muscles and cramps are observed.

- Ammonia poisoning cases are not seen in the presence of carbonic acid caused by easily digestible carbohydrates.

- For the release of ammonia poisoning, the pH in the rumen fluid should be above 6 and the concentration of ammonia should increase to the upper limit of 1000 mg / l.

- When rumen pH is lower than 6, the amount of ruminal ammonia may increase without poisoning.

# Nitrate poisoning

- The nitrate replaces the oxygen in the rumen as it turns into nitrite and is absorbed into the blood. Blood cannot carry oxygen and the cow is at the point of suffocation (nitrite poisoning)
  SYMPTOMS:
  Increased respiratory rate
  staggered walking
  death after first symptoms
  CHRONIC SYMPTOMS:
  dizziness, increased urinary excretion, diarrhea, growth rate and decreased milk yield
  In poisoned animals the blood gets chocolate brown.

- Adult animals can tolerate a maximum of 200 g of nitrate per day.
  Taking more than 100 g / day has a detrimental effect.
  Poisoning occurs as a result of consuming high levels of nitrate in a short time.
  It is reported that high amounts of nitrate containing dry grass or silage are more dangerous than pasture grass. (This depends on the consumption of more feed by grazing).

# Mycotoxicoses

- Poisoning of mold toxins in animals is caused by poisoning.
- During the storage of feeds containing large amounts of moisture (> 15%), mold growth occurs.
- To prevent this, feeds can be treated with organic acids such as propionic acid and ammonia.

# Mycotoxins and their effects

| | | |
|---|---|---|
| Penicillium species (all feeds) | Ochratoxin A Citrinin, Clavicilin Patulin, Tremortin, Rubratoxin A, B | Hepatotksic, neurotoxic, nephrotoxic, carcinogenic and teratogenic effect, decrease in feed consumption, thirst, polyuria (excess urine), polydipsia (craving), cramps, abortion, high embryonal deaths, body temperature |
| Stachybotrys alternans (dry forage) | Stachybotrytoxin (Satratoxin) | Drooling, swelling of the lips, stomatitis, gastroenteritis, diarrhea, leukopenia (leukocyte reduction), rumen atony |
| Sporidesmium bacteri (in kolzada) | Sporiesmin A, B, C | Stomatitis, rhinitis, faringitis, gastroenteritis, disorders of the central nervous system, hepatotoxic |
| Pithomyces chartarum (in herbs and leguminoses) | Sporiesmin A, B, C | BW loss, icterus, photosensitivity, dermatitis |

# There is no toxin in the dishwashing feed with mushrooms.

- On the other hand, fungus is not always observed in feeds containing mycotoxins.
- The most severe poisoning results from aflatoxins produced by Aspergillus flavus.

- Mushroom growth is very fast in humid environments. Mushrooms such as Aspergillus, Penicillium, Fusarium, Stachybotrys and Sporotrichum can grow rapidly in silage.
- The Mucor species is also observed in the wet silage.
- This is a danger when the feeds to the silo are not pressed too much.
- For this reason, silage DM should be increased to at least 35% with dry feed.
- If the amount of aflatoxin in feed dry matter is above 0.05 ppm, it is considered to be mycotoxin.
- Feeds exceeding 2 ppm are not given to animals.

- Especially duck chicks, rabbits, turkeys, guinea pigs, rainbow trout are very sensitive to mycotoxins.
- Sheep and rats are more durable.
- The disease is characterized by long-term efficiency, weakness, reduced feed consumption, non-specific symptoms such as tympani, diarrhea, apathy, paralysis and tendency to bleed.
- Mutagenic, teratogenic and carcinogenic effects are seen.

- **Zearalenone** is like hormone-like effect. It is over-expressed in humid and low temperature environment by Fusarium fungi. Corn, corn by-products and especially corn silage are more common.
- Distortions caused by mycotoxin are not much in cattle. Approximately 50% of the toxin contained in the feed is in the silage stage and 30-60% is broken in the rumen.

- Mycotoxin (Zearalenon) poisoning in cattle:
- - Young people: breast inflammation, swelling in the vulva, calf loss at birth
- In the noses: swelling of the vulva, long anger or persistent anger symptoms, ovarian cyst, genital inflammation, early abortion are observed.

- Fungal feed should not be given due to the danger of fertility (abortion).
- It does not have a significant effect on digestion and microfauna if mixed with small amounts of other feeds.
- If the amount is low when used in nutrients, the danger is low.