

Equinovation



Sustainable equestrianism

Dr. Hilde Vrancken

Highlights

About Equinovation

Introduction

Origin & evolution of the horse

The digestive system

What about the liver?

Immunity & gut-brain connection

Dietary plan



ABOUT EQUINOVATION

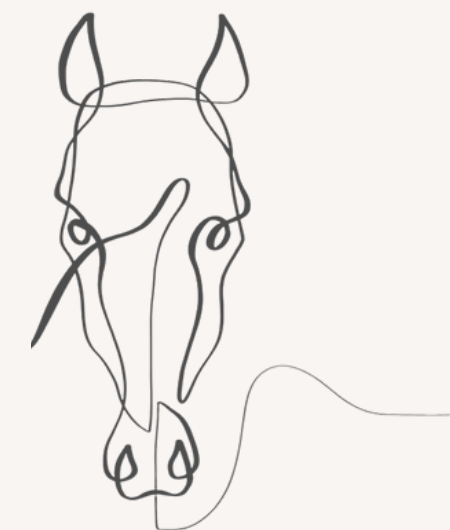


- **International consultant – Animal health & sustainable animal husbandry**
- Over 20 years experience in research & development + sales & marketing in global animal health products
- Co-author VERRA methodology for reduction of enteric methane emissions
- Co-author of 2 peer reviewed scientific publications on enteric methane emissions
- 3th generation breeder & owner of international showjumping horses



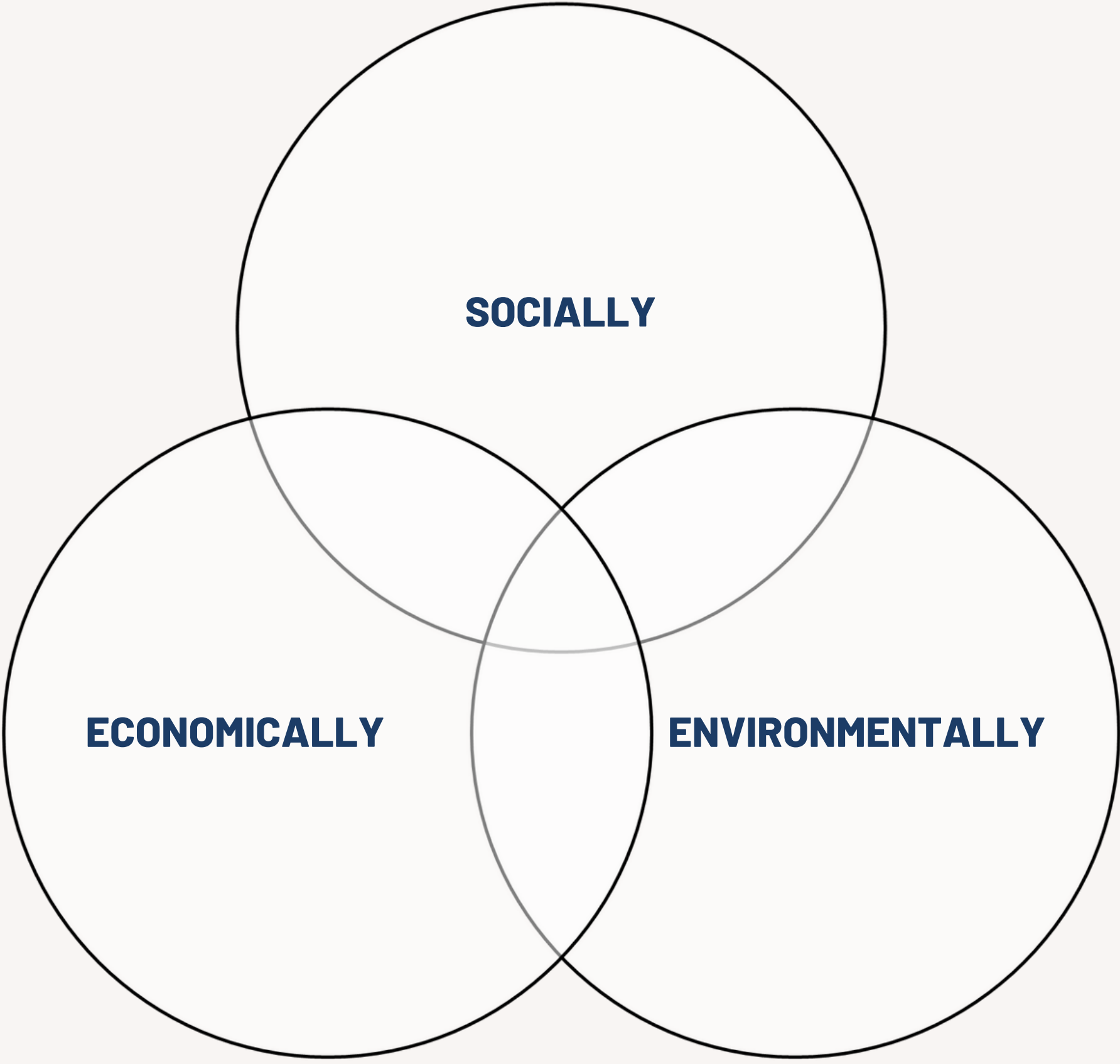
B-E-S^t
ANIMAL HEALTHCARE

THERAΔVET



"What is
sustainable equestrianism?"





EQUINE INDUSTRY NEEDS TO BECOME MORE SUSTAINABLE

- **Socially:** Brambell's five freedoms
- **Economically:** Protect the high number of FTEs in the industry by walk our talk and communicate about it in a professional way
- **Environmentally:** reduce the carbon footprint of the industry



BRAMBELL'S FIVE FREEDOMS

1

Freedom from hunger or thirst by ready access to fresh water and a diet to maintain full health and vigour.

2

Freedom from discomfort by providing an appropriate environment including shelter and a comfortable resting area.

3

Freedom from pain, injury or disease by prevention or rapid diagnosis and treatment.

4

Freedom to express (most) normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind.

5

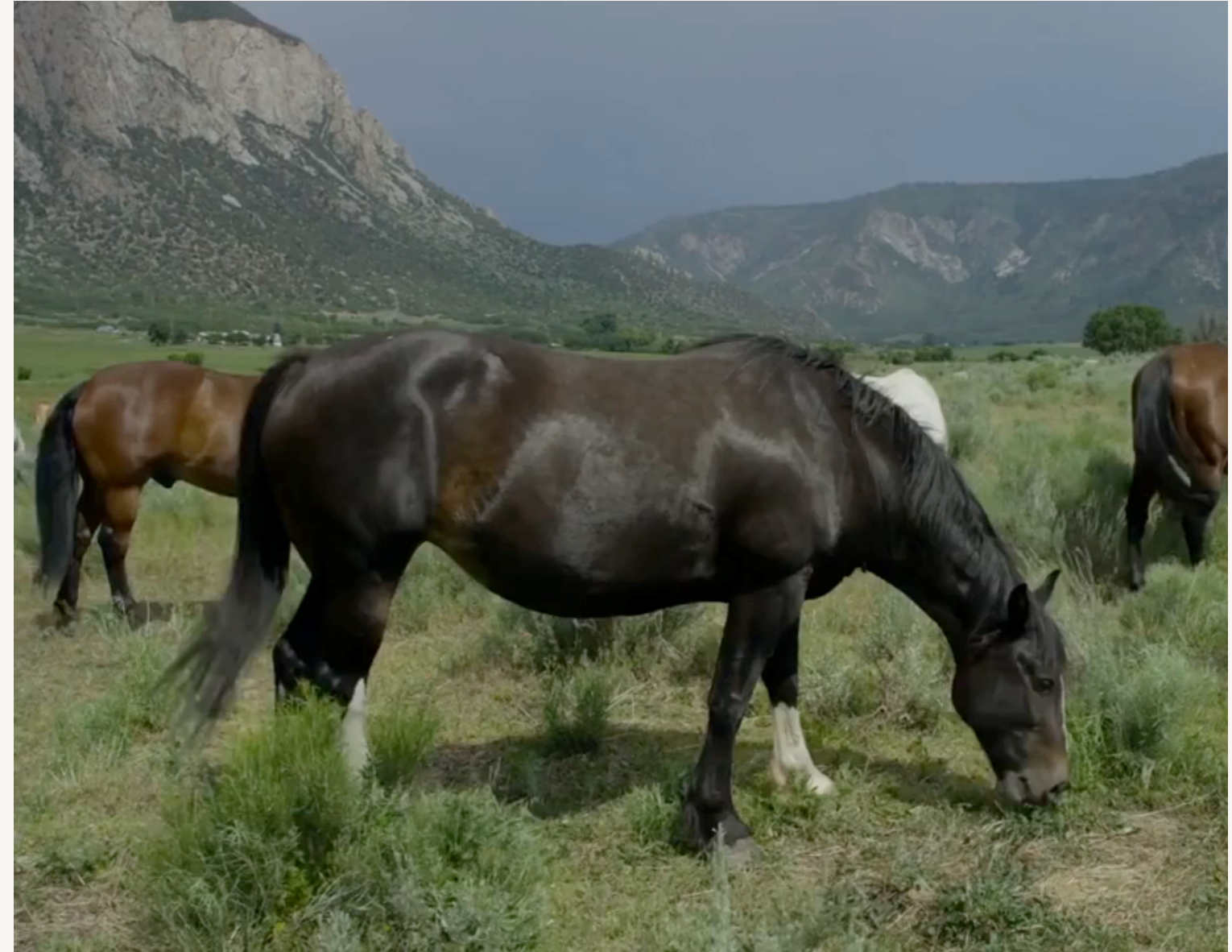
Freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering.



- Respect the digestive system
- Horse is a hindgut fermenter
- Diet high in fiber
- Variation in fiber to optimize microbiome
- Careful with starch & sugar
- Horse need to chew a lot to produce saliva to buffer gastric acid
- Prevent nutrition related pathologies (gastric ulcers, insulin sensitivity, obesity, laminitis, muscle problems because not enough protein, ...)
- Optimal microbiome will fortify immune system and improve general health, will strengthen the gut-brain axis, so will give us a healthy, happy athlete



- Herd Animal
- Covering huge surfaces
- 16 hours daily grazing and walking
- Shorter, harder grasses with herbs, nuts, leaves, etc.
- Energy from crude fiber
- Low in energy
- Low stress levels



HORSES | IN GRANDMOTHER'S TIME

- Working on the land
- Little time to eat
- Quick release of energy needed
- Easy transport of feed



HORSES | NOW AND THEN

- Much more in stable
- Less moving around
- More stress
- Green pastures
- Little variation in grasses
- High energy starch feeds

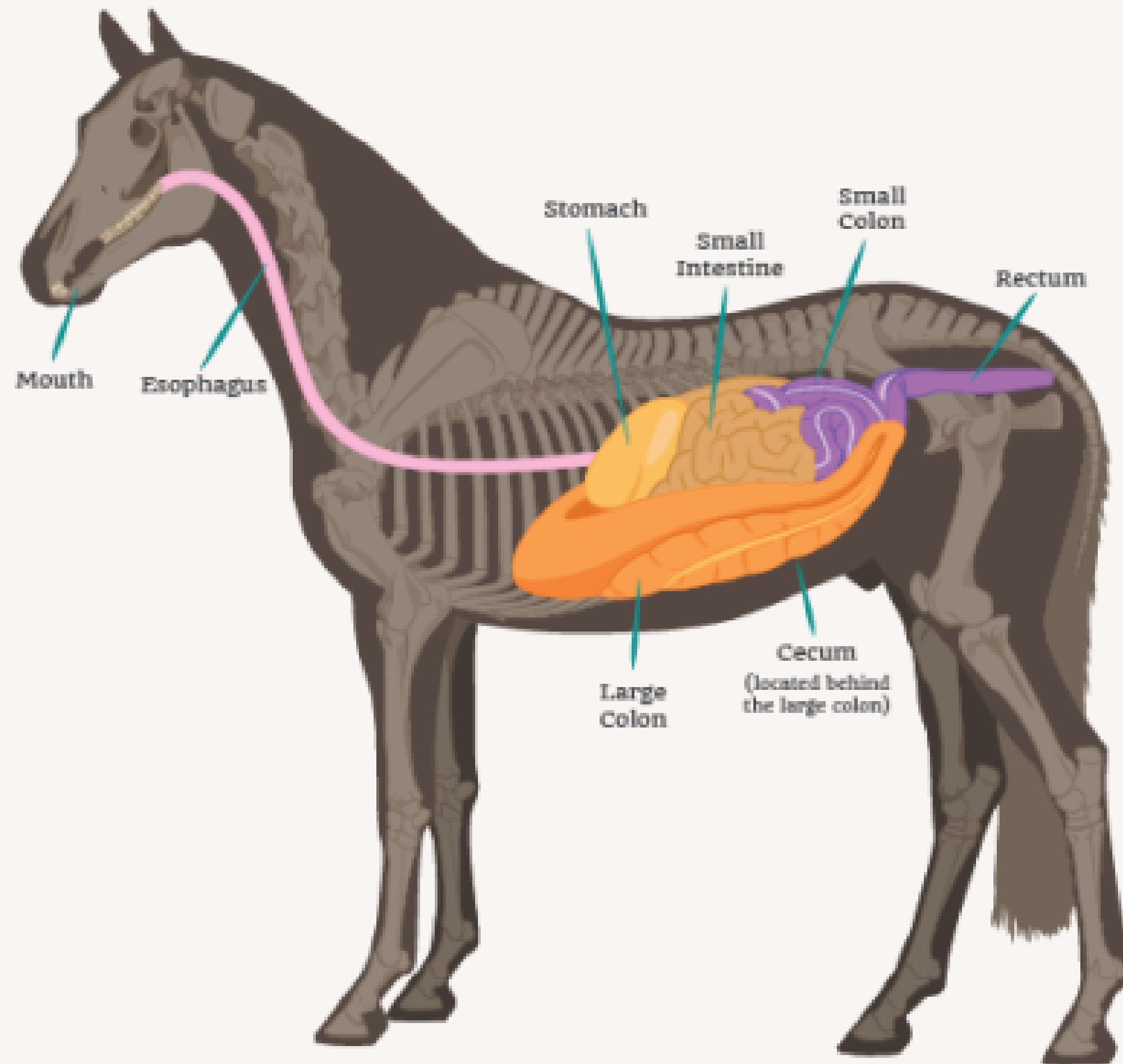


VS.

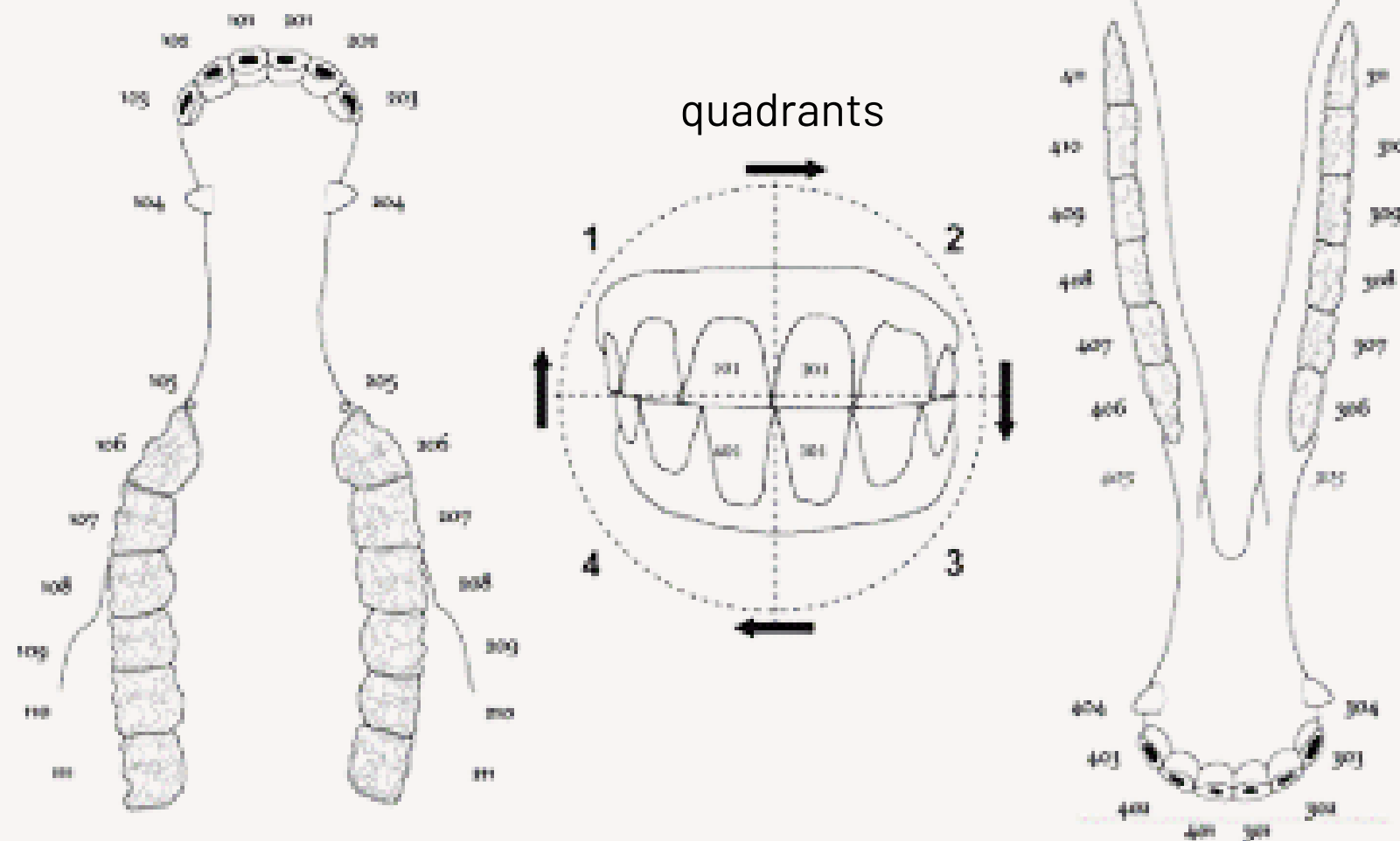
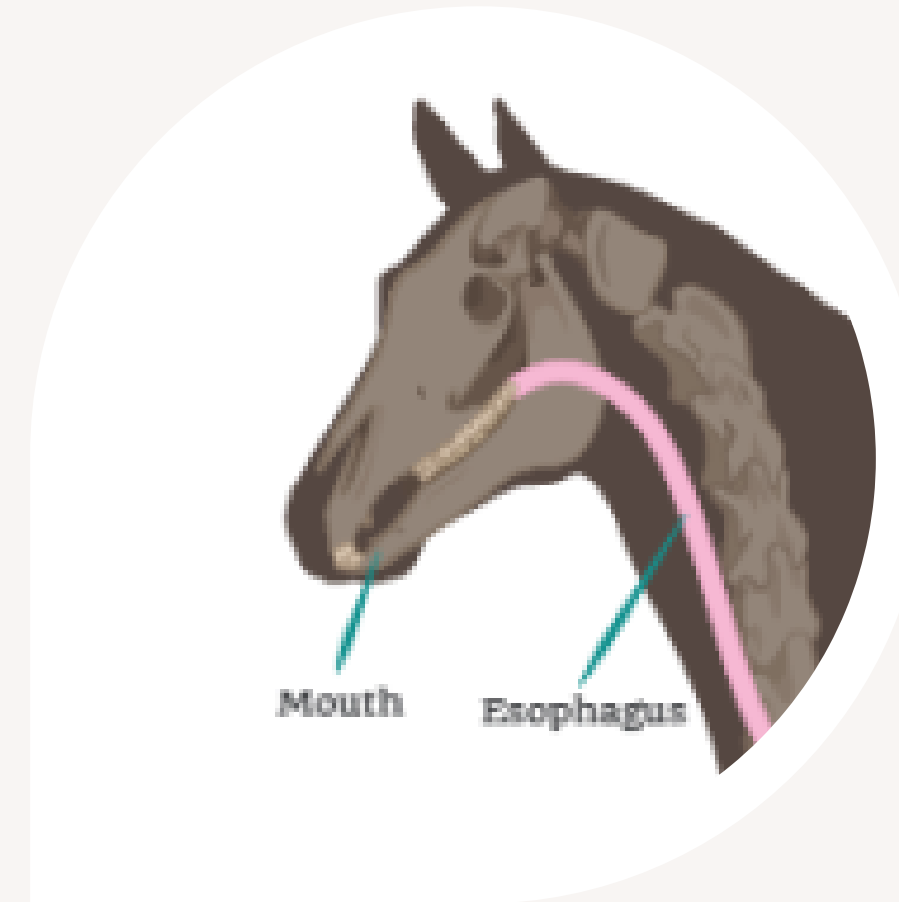


HORSES | THE DIGESTIVE SYSTEM

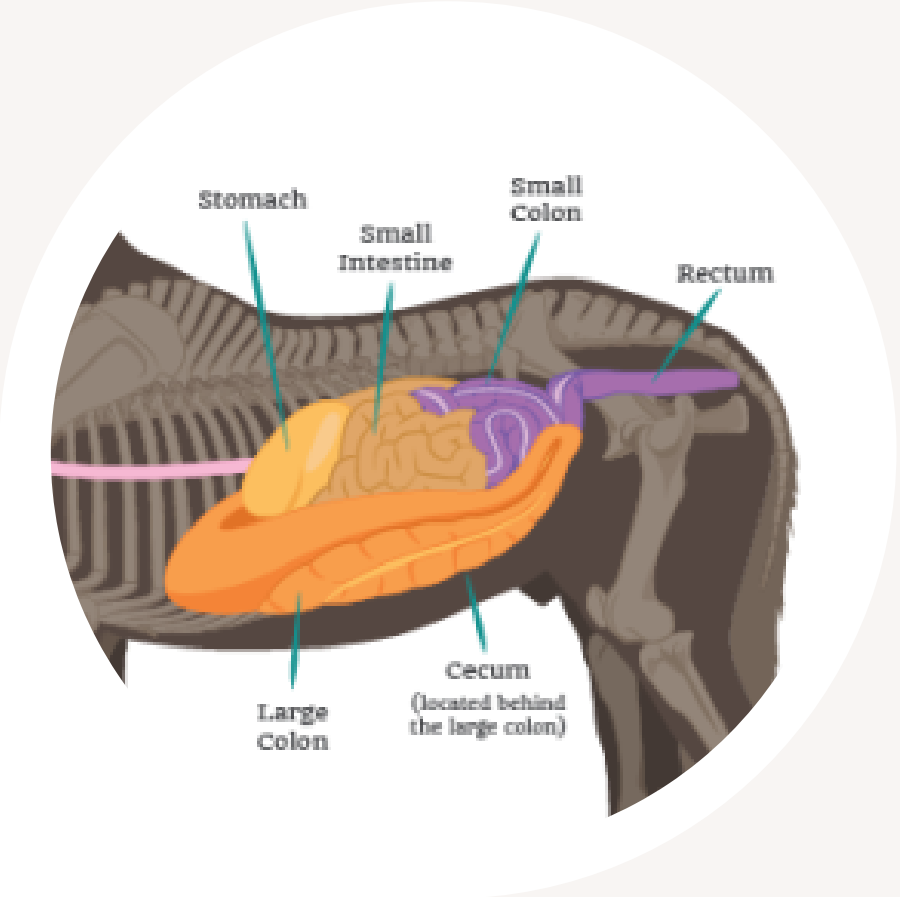
We need to feed according to the physiology of the digestive system.



- 12 incisors and 24 molars
- Objective of chewing:
 - Grind the feed
 - Pass through esophagus
 - Enlarging the surface to let enzymes work
 - Production of saliva



HORSES | THE STOMACH



	1 kg grain	1 kg hay
Chewing movements	800 - 1200	3000 - 3500
Saliva	1 - 2 L	3 - 5 L
Chewing time	8 - 15 min	40 - 45 min



- Saliva to neutralize stomach acid
- Small volume of the stomach
- 2 parts in the stomach:

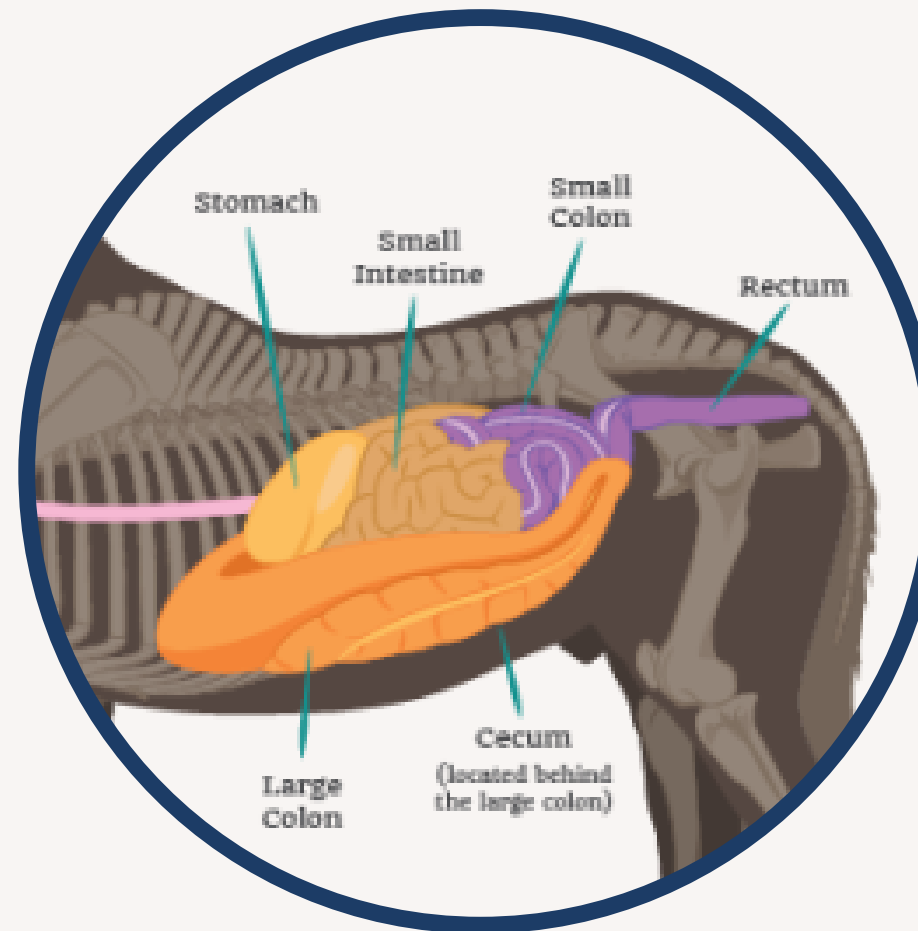
Squamous part

- First digestion sugars and starch
- Sensitive for acid and ulcers

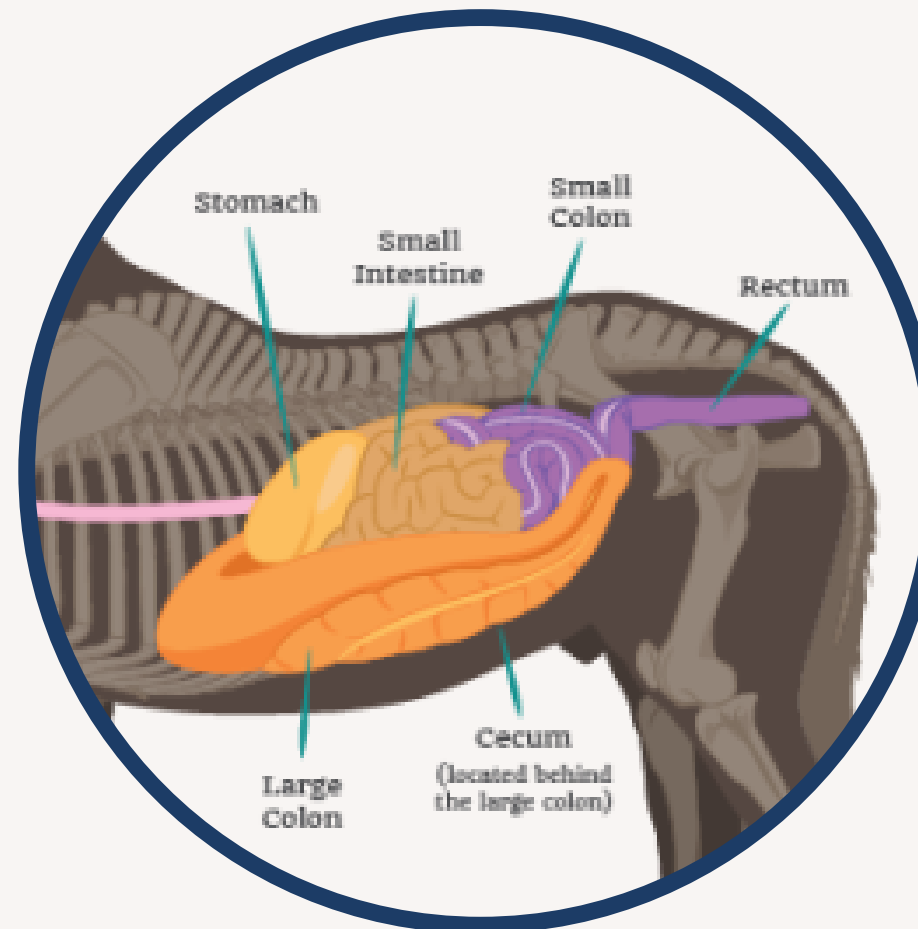
Glandular part

- Constant acid production
- Low pH (2,5-3,5)
- Bicarbonate rich mucus
- Lipase & pepsinogen production

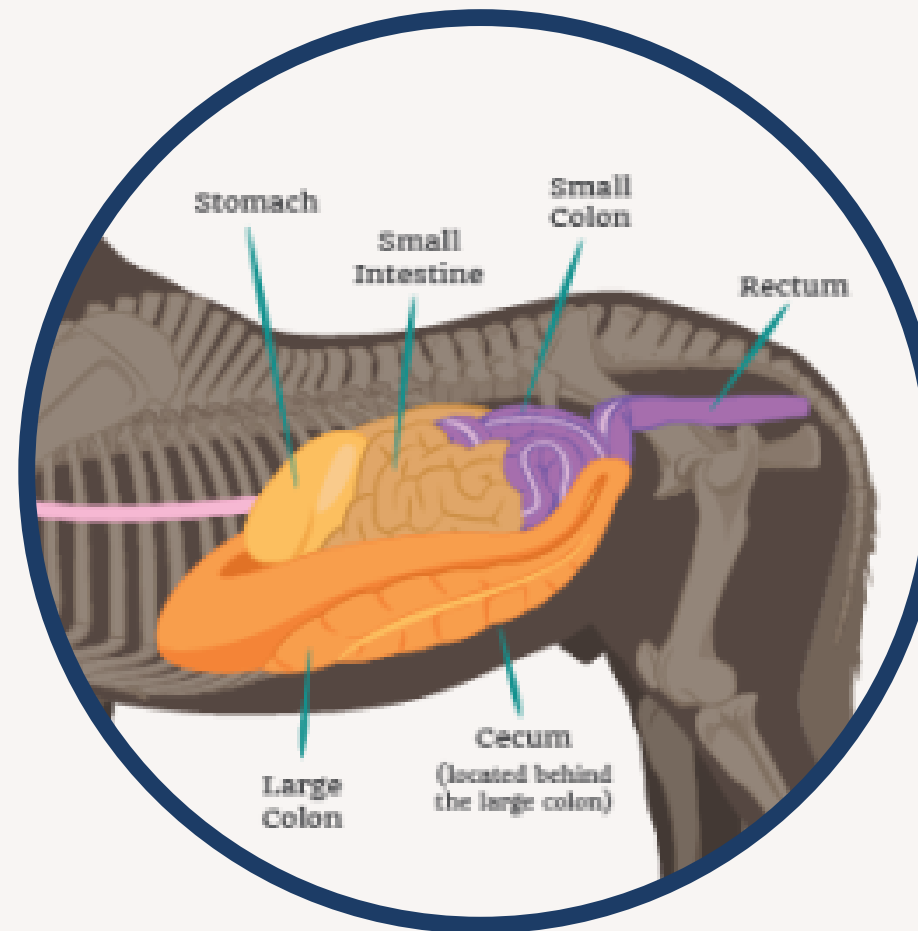
- **Lipase > digestion of fat**
- **Pepsinogen > digestion of protein**
- **Acid to kill pathogens**



- Feed stays 2-6 hours in the stomach
- Little saliva => stays longer in stomach
- Changing pH
- Less protein digestion
- Less absorption of vitamins
- Increased pressure of pathogens
- Gastric ulcers
- Intestinal flora changes
- More gas production



- Small intestines
 - 20 m long
 - Quick transport of feed
 - Digestion of proteins, carbohydrates and fat



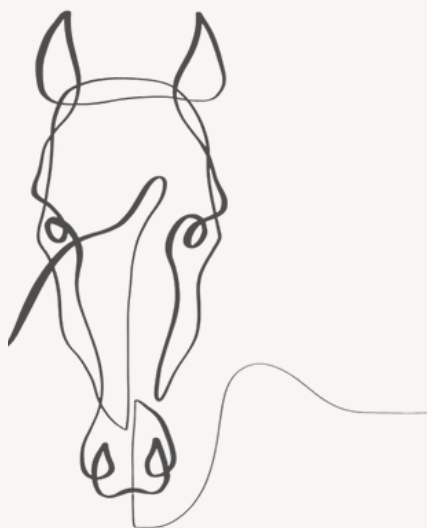
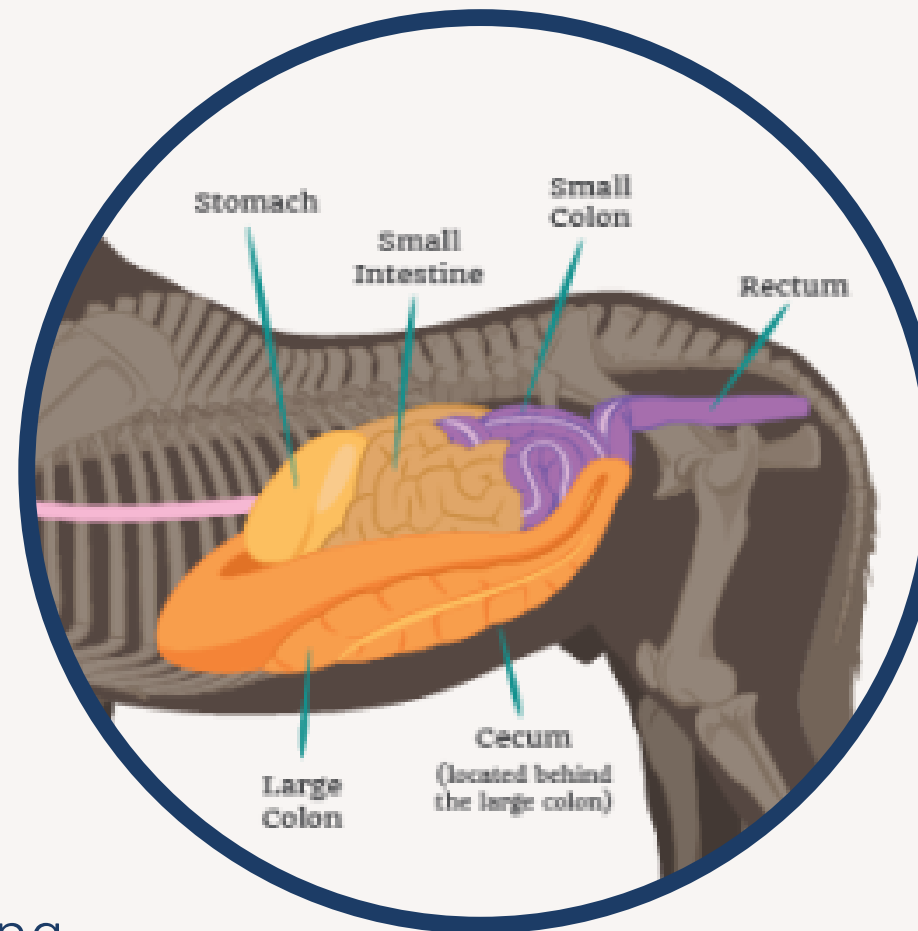
- Large intestines
 - 7 meter long and the engine of the digestion

Fermentation of fiber:

- Production of short chain fatty acids
(Energy for the horse)
- Production of vitamin B and K

Issues with the digestion:

Diet low in fiber and high in starch > Changing microbiome > Affected digestion > Acidification hindgut > body wide inflammation

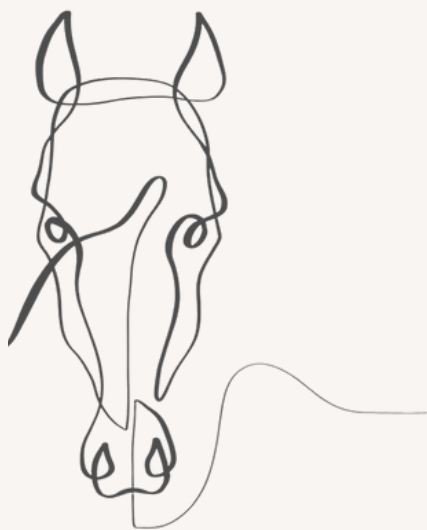
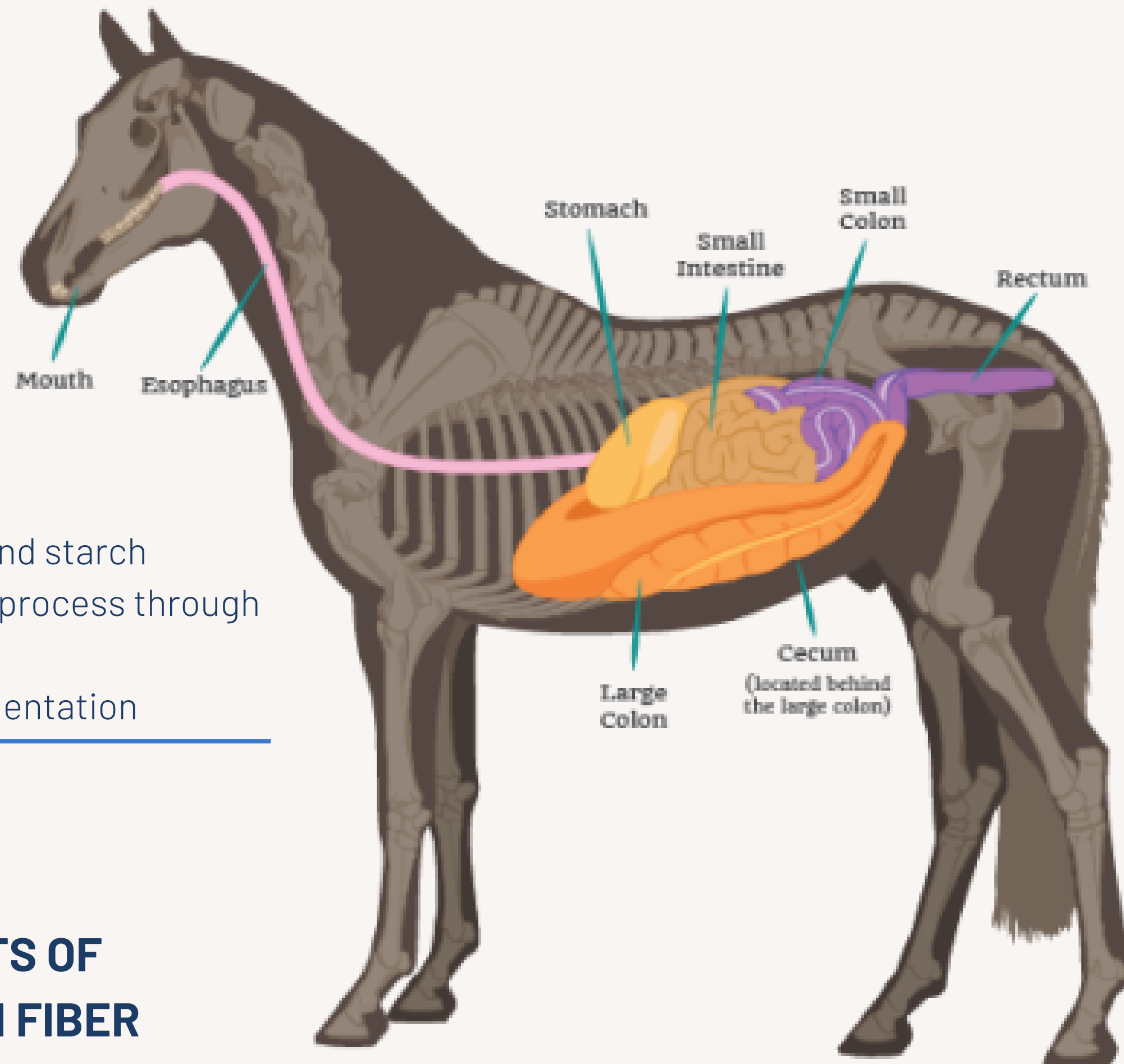


We need to feed according to the physiology of the digestive system.

- Be careful with sugar and starch
- Optimize the digestive process through the entire system
- Stimulate hindgut fermentation



**BIG BENEFITS OF
VARIATION IN FIBER**

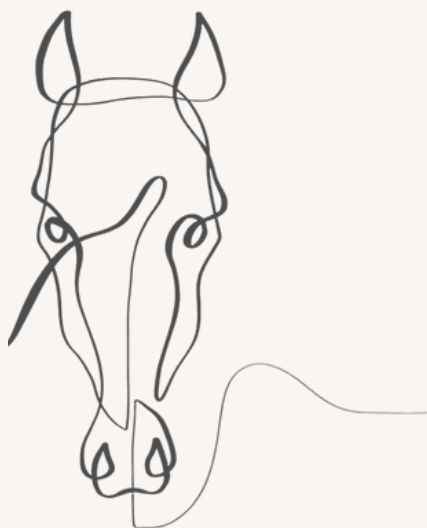
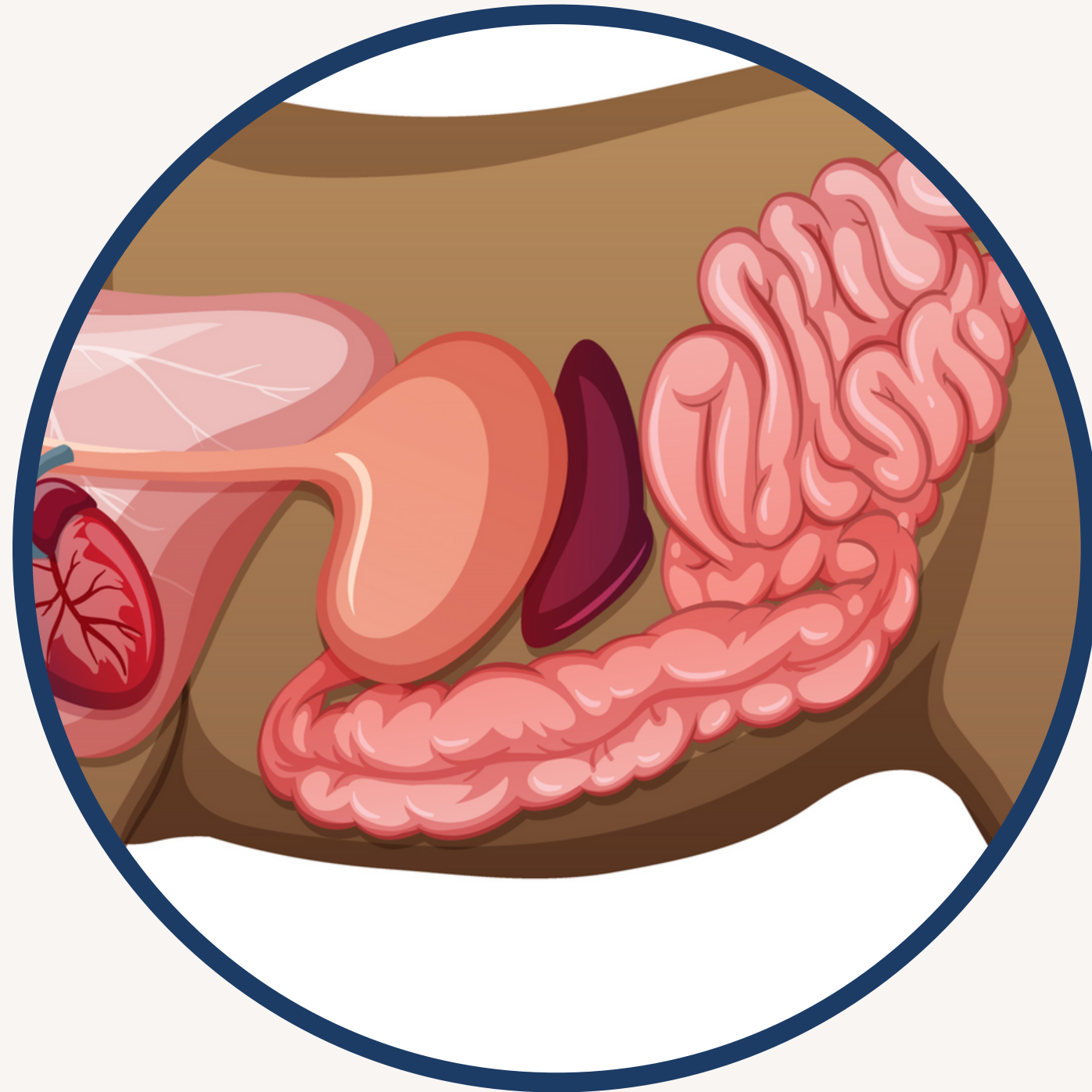


THE LIVER... A JEWEL TO CHERISH

- Energy storage and redistribution
 - Everything we put in the stomach passes the liver
 - Regulation center for blood sugar level
 - Production proteins for muscles, immune functions and blood clotting
- Detoxification of the body
 - Mycotoxins, toxic plants, degradation products of red blood cells & proteins

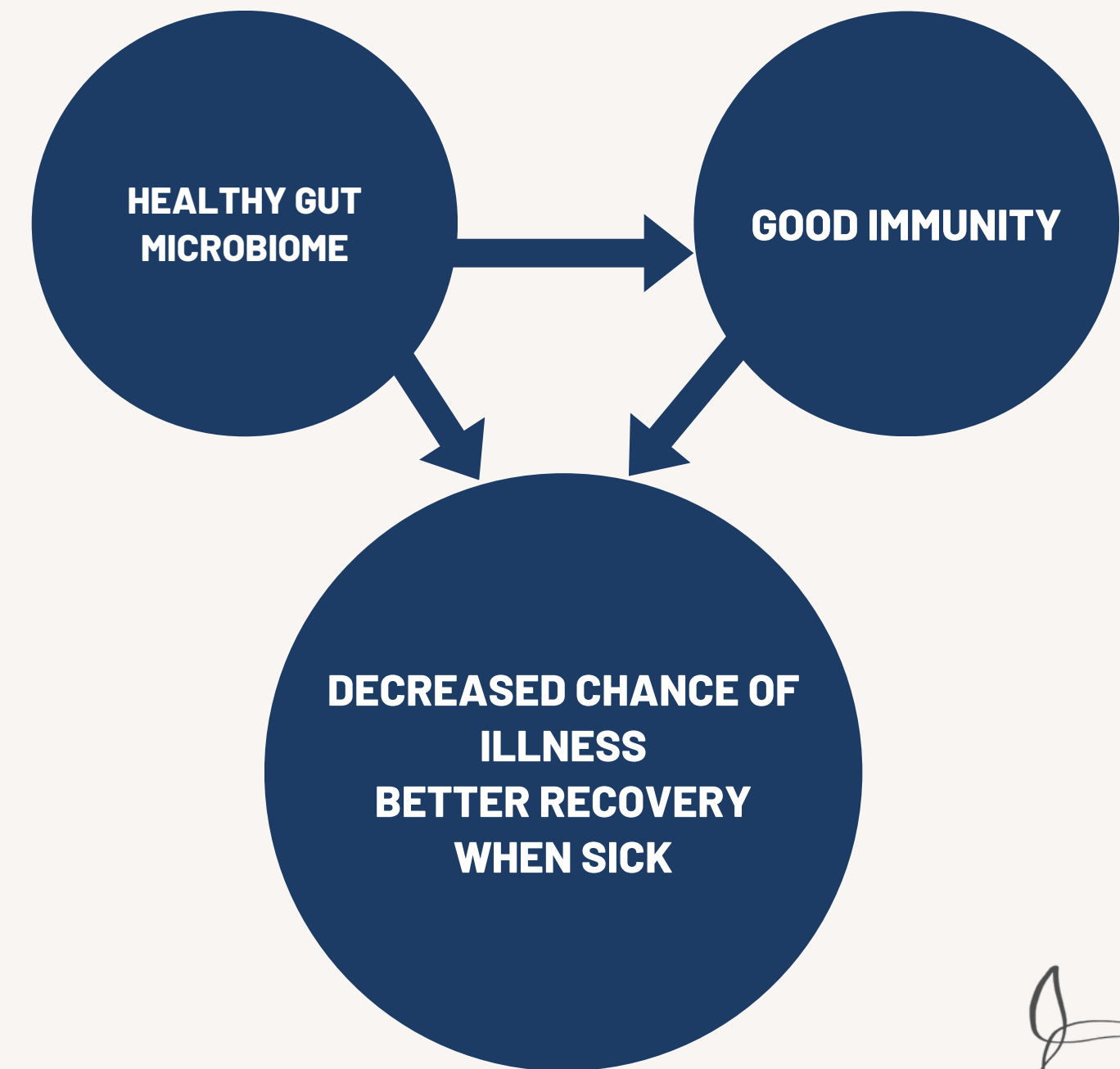


**OPTIMIZE TOTAL SUPPLY
TO THE LIVER**



GOOD IMMUNITY STARTS IN THE GUT

- Up to 100 trillion **bacteria** in the gut
- We call that gut **microbiome**
- Gut microbiome is the **primer** of the **immune system**
- Immune system is army of different white blood cells, each with a specific function, always standby to protect the body
- **80%** of the immune cells are in the **gut**

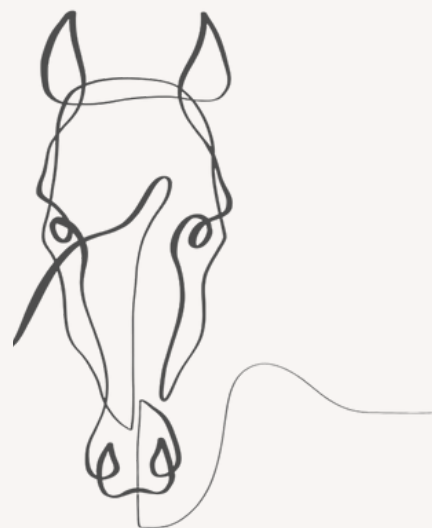
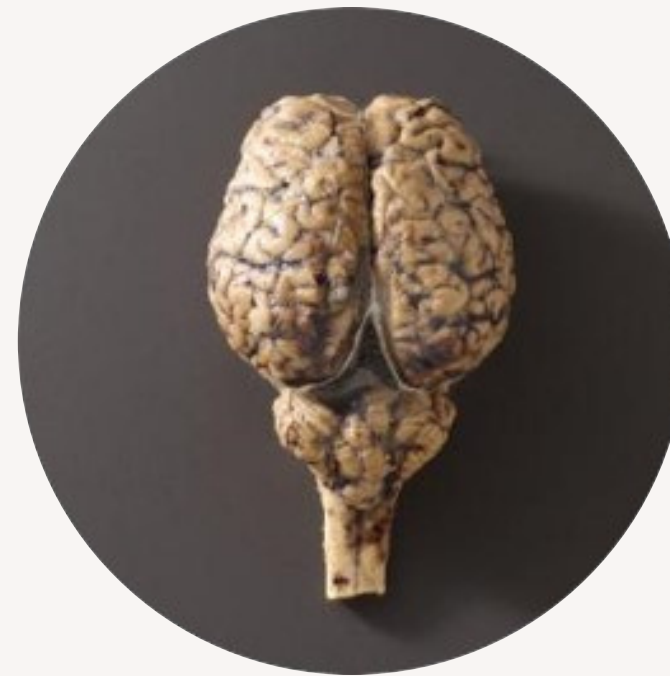


- **Butterflies in your stomach?**
- **Nauseous with fear?**
- **Knot in stomach with worry?**
- Connection and communication between gut and brain
- Gut microbiome participates in this communication
- Scientific mice study 2004 with normal and sterile mice has proven sterile mice reacted stronger on induced stress and behaved normal after introduction bacteria in the gut



GUT – BRAIN CONNECTION

- **Bi-directional crosstalk between gut and brain, but also lungs, joints and skin**
- **All these links are facilitated by the microbiome**



RATION DETERMINATION



HOW MUCH HAY DO I NEED TO FEED?

1,5% of the bodyweight needed in dry matter from roughage

- Horse of 600 kg needs 9 kg dry matter from roughage
- This is 45 kg grass (80% water)
- This is 10 kg dry hay (10%water)

what's the weight of your horse?

Nutrient	Energy level
Grass	0,15
Hay	0,50



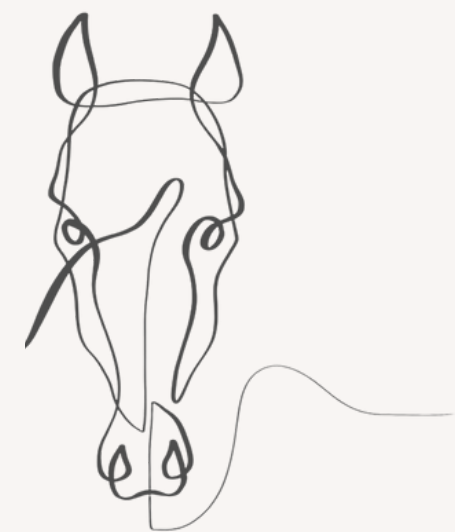
EWPa: gives you the energy value of a product

Daily requirement: 0,008 EWPa/kg bodyweight

- A horse of 600 kg needs **5 EWPa**

Extra for exercise:

Level	Extra enery horse 600 kg
Recreation and light sport	1,18
All sport M-Z	1,90
All sport Z&ZZ	2,47
Eventing, trot and flat race	5,80

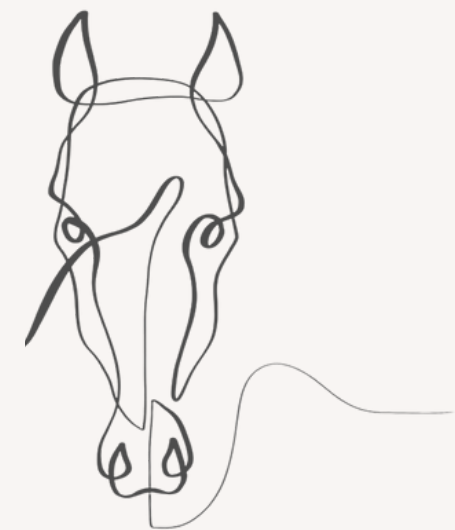


Example: Z jumping horse of 600 kg

- 5 EWPa for maintainance
- 2 EWPa for exercise

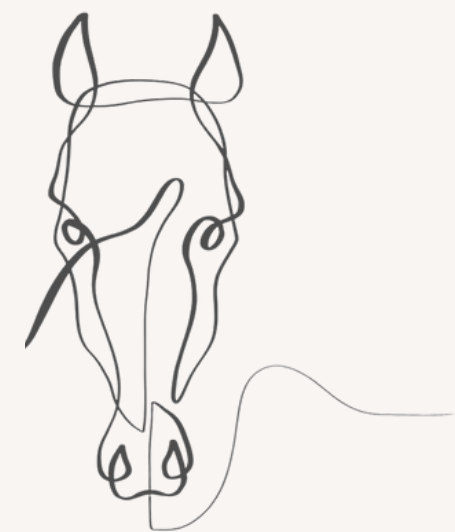
Nutrient	Energy value (EWPA)
10 kg hay	5
How much more to add?	2

- Max 2 g carbohydrates/kg BW/feeding
- Proteins, vitamines and minerals
- Analyze your hay

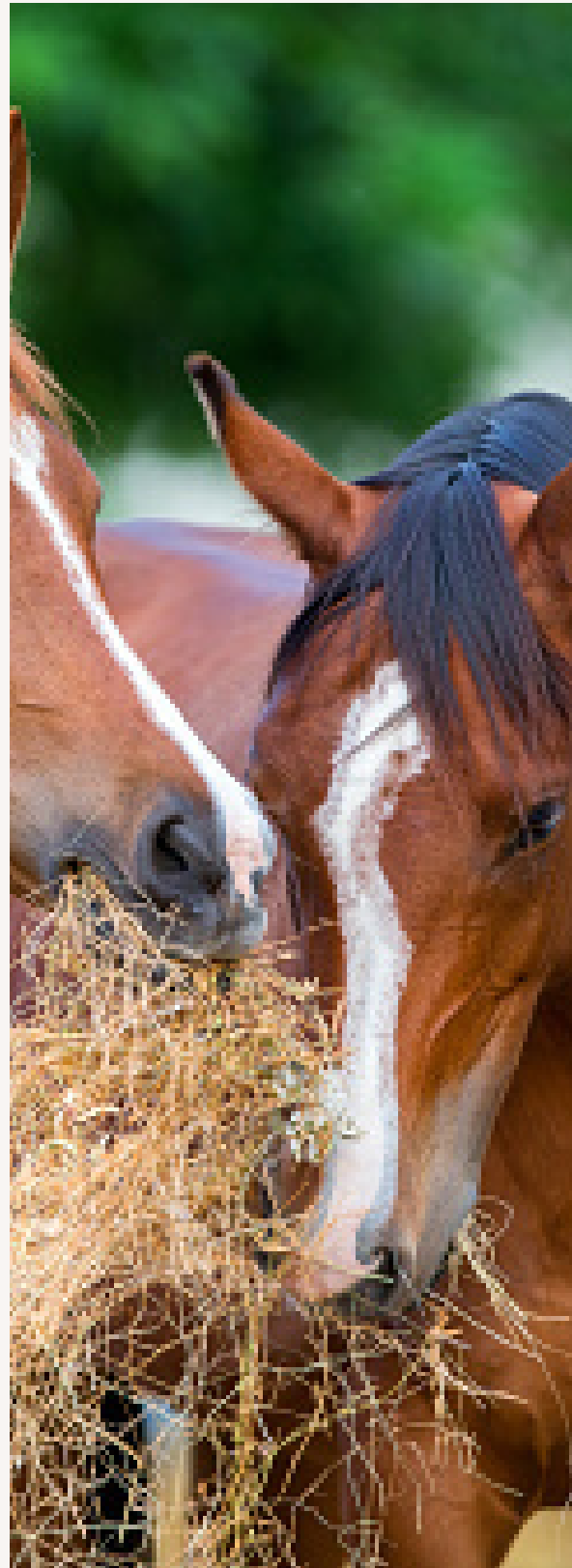
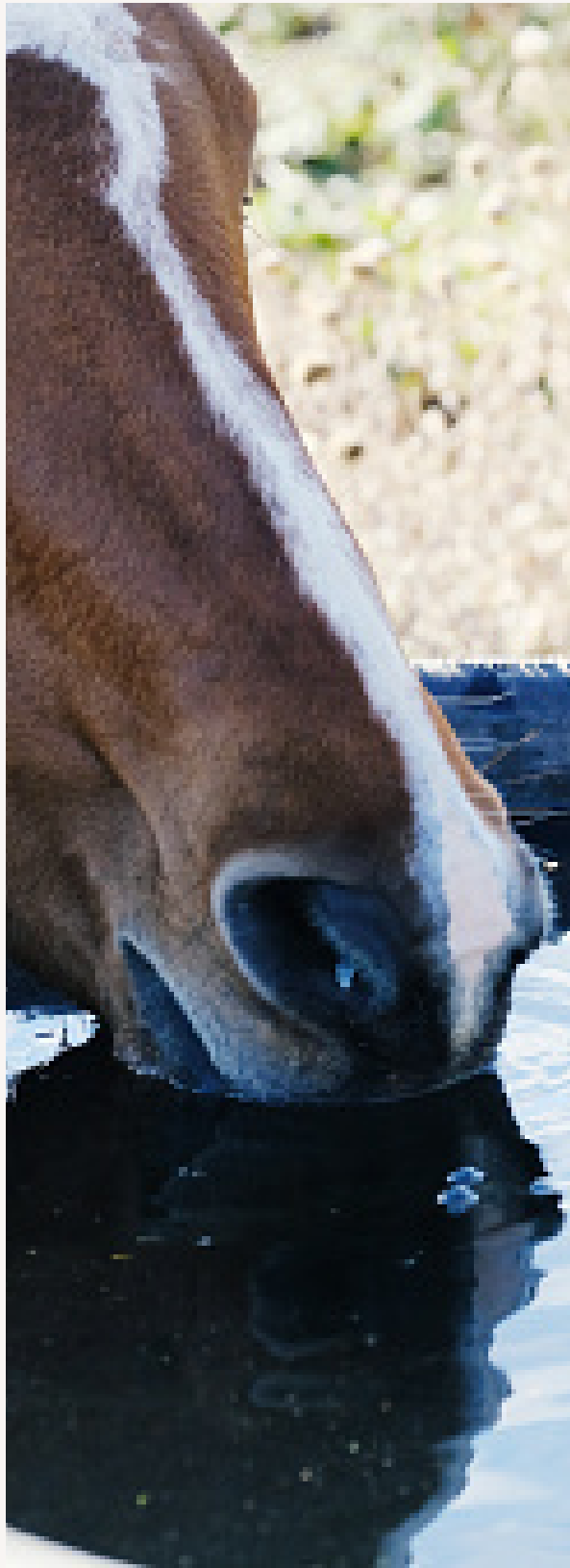


PROTEINS

Horse 600 kg	Gram/day
Maintainance - light work	500-600 gram
Medium work	800 gram
End of pregnancy	850 gram
Lactation	1600 gram



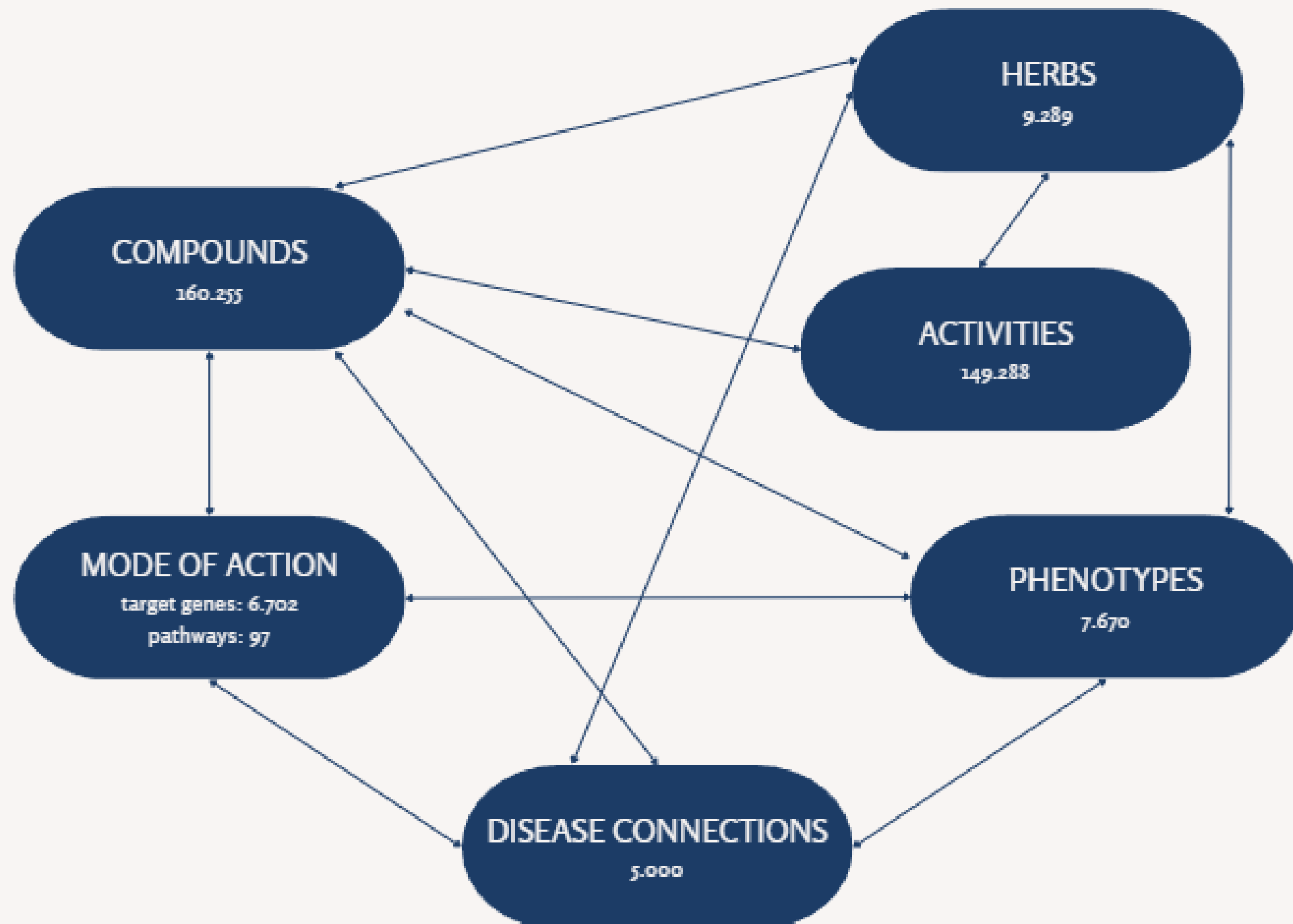
WATER & HAY



- Check water quality
- Protein is getting lower and carbohydrates are getting higher every year
- Soil quality is getting worse
- We need to feed the feed differently
- New generation fertilizers



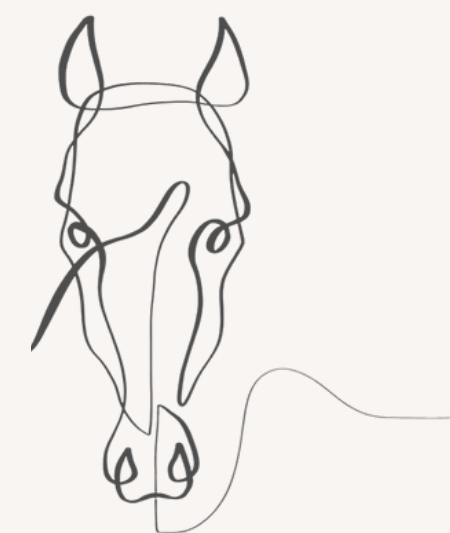
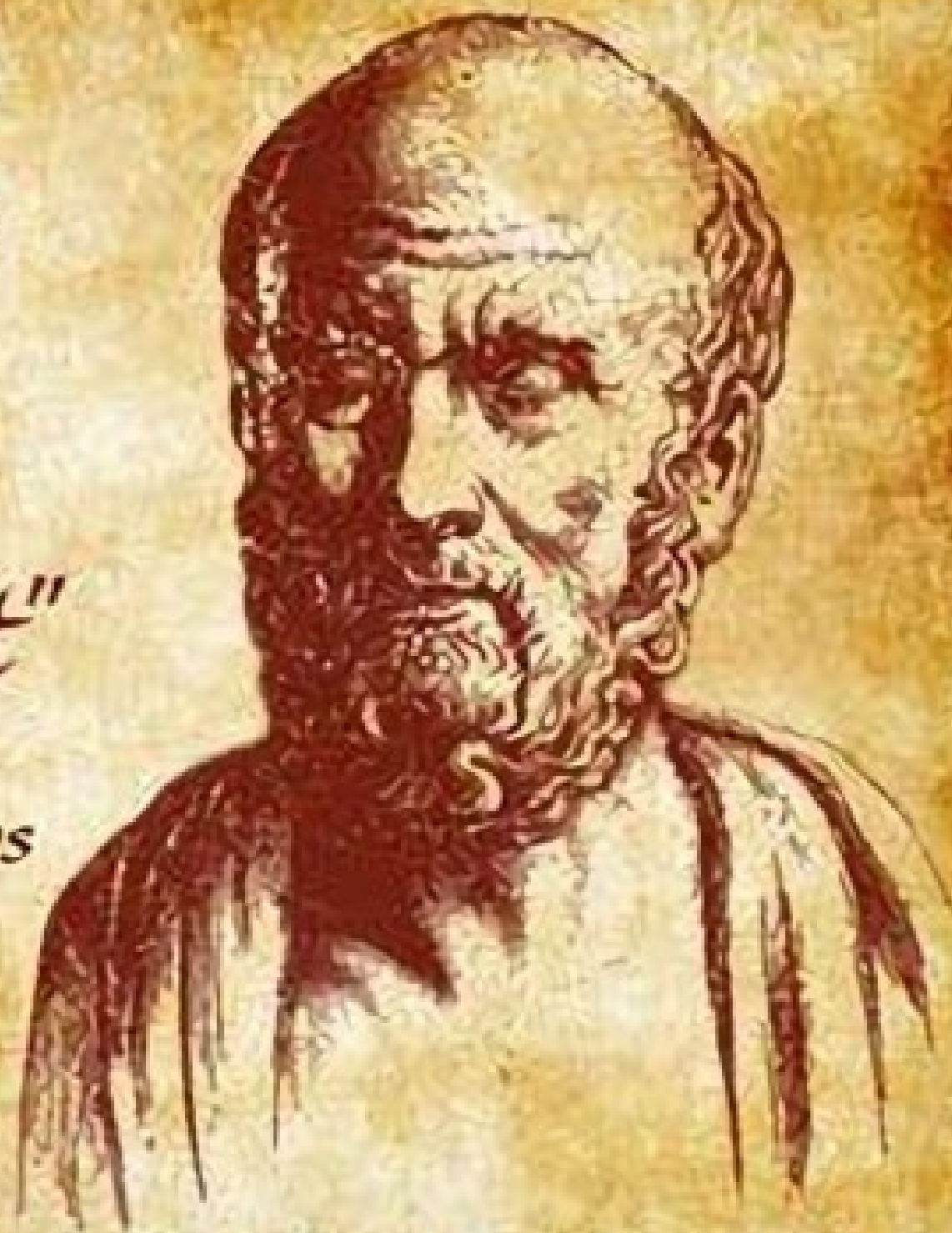
SUPPLEMENTS



- Horses are often getting several supplements for a longer period of time
- There is a risk for overdosing with individual ingredients
- Choose for a targeted use of supplements when needed
- Recommendation is to go for the right combinations of bio active molecules in a sufficient concentration



*"All Disease
begins in
the gut"*
~Hippocrates





"Together towards a
sustainable equine industry
with a healthy, happy
athlete."

Thank you

Sustainable equestrianism

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