Monogastric Digestive System
Different Digestive Systems

• The three different types of digestive systems are:
  • Monogastric
  • Modified Monogastric
  • Ruminant
What is Digestion?

Digestion is the process by which large, complex nutrient molecules are broken down into simpler molecules capable of being used by the organism for food.
Simple Stomach

Humans, swine, rabbits, chickens and horses all have a simple stomach, which is also known as a monogastric digestive system.
Monogastric

- Carnivores and omnivores have monogastric digestive systems.
- Monogastric systems have a simple stomach structure and only one compartment.
- Some animals with monogastric digestive systems are pigs and rabbits. Humans also have monogastric digestive systems.
Digestive Tract of the Monogastric Mammal

ANUS
COLON
ILEUM
JEJUNUM
PANCREAS
DUODENUM
ESOPHAGUS
STOMACH
SALIVARY GLANDS
MOUTH
TONGUE
TEETH
LARGE INTESTINE
RECTUM
CECUM
VILLI
SMALL INTESTINE
GALL BLADDER
LIVER

8/7/2014
Parts and functions of the monogastric mammal digestive system continued...

- Small Intestine
  - enzymatic digestion and absorption
  - Functions of the small intestine: digestion of proteins, carbohydrates, and fats; absorption of the end products of digestion
    1. duodenum - most digestion occurs here
    2. jejunum - some digestion and some absorption occur
    3. ileum - mostly absorption
  - Bile - made in liver, stored in gall bladder, active in the small intestine, emulsifies fat to aid in digestion
Parts and functions of the monogastric mammal digestive system continued...

- Enzymes in the small intestine

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Function</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>trypsin</td>
<td>digest proteins</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>chymotrypsin</td>
<td>digest proteins</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>carboxypeptidases</td>
<td>digest proteins</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>pancreatic amylase</td>
<td>digests carbohydrates</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>lipases</td>
<td>digests lipids</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>disaccharides</td>
<td>digests carbohydrates</td>
<td>secreted from small intestine</td>
</tr>
<tr>
<td>dipeptidases</td>
<td>digest peptides</td>
<td>secreted from small intestine</td>
</tr>
</tbody>
</table>
Parts and functions of the monogastric mammal digestive system continued...

• **Cecum** - essentially non-functioning in many monogastrics. Rabbits and horses have an enlarged cecum that acts like a rumen and is involved with microbial digestion (fermentation)

• **Large Intestine**
  - bacterial activity
  - water absorption
  - waste storage
What type of digestive system is this?

Ruminant
What type of system is this?

Monogastric
How does that compare to you?
Monogastric Digestive Systems
Different Digestive Systems

- The three different types of digestive systems are:
What is Digestion?

Digestion is the process by which large, ________________ molecules are broken down into simpler molecules capable of being used by the organism for food.
Simple Stomach

Humans, __________, rabbits, ___________ and horses all have a simple stomach, which is also known as a ________________ digestive system.
Monogastric

• _______and omnivores have monogastric digestive systems.

• Monogastric systems have a simple stomach structure and only ______ compartment.

• Some animals with monogastric digestive systems are pigs and rabbits. ______ also have monogastric digestive systems.
Digestive Tract of the Monogastric Mammal

ANUS

COLON

ILEUM

JEJUNUM

PANCREAS

DUODENUM

ESOPHAGUS

STOMACH

SALIVARY GLANDS

LARGE INTESTINE

RECTUM

CECUM

VILLI

GALL BLADDER

MOUTH

TONGUE

TEETH

LIVER

SMALL INTESTINE
Parts and functions of the monogastric mammal digestive system continued...

- **Small Intestine**
  - enzymatic digestion and absorption
  - Functions of the small intestine: digestion of ____________, carbohydrates, and_________; absorption of the end products of digestion
  1. **duodenum** - ________________________________
  2. _________ - some digestion and some absorption occur
  3. **ileum** - ________________________________

- Bile - made in liver, stored in gall bladder, active in the small intestine, ___________________________ to aid in digestion.
Parts and functions of the monogastric mammal digestive system continued...

- ___________________________ in the small intestine

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Function</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>trypsin</td>
<td>digest proteins</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>chymotrypsin</td>
<td>digest proteins</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>carboxypeptides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pancreatic amylase</td>
<td>digests carbohydrates</td>
<td>secreted from pancreas</td>
</tr>
<tr>
<td>lipases</td>
<td>digests lipids</td>
<td></td>
</tr>
<tr>
<td>disaccharides</td>
<td>digests carbohydrates</td>
<td>secreted from small intestine</td>
</tr>
<tr>
<td>dipeptidases</td>
<td>digest peptides</td>
<td></td>
</tr>
</tbody>
</table>
• _______________ - essentially non-functioning in many monogastric animals. Rabbits and horses have an enlarged cecum that acts like a rumen and is involved with microbial digestion (fermentation)

• Large Intestine
  - bacterial activity
    - _______________
What type of digestive system is this?
What type of system is this?
How does that compare to you?