

Fetal Pig Dissection

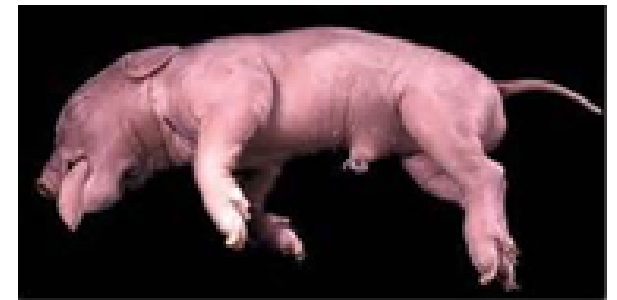
Day 2 The Digestive System



Objectives:

- Identify and describe the functions of the main organs of the digestive system.
 - Gain an appreciation of the spatial relationships of the many organs and structures that contribute to the digestion of food and the nourishment of the body's cells.

Materials Needed: Ready.....go!



Dissecting Tools
Dissecting Tray
Fetal Pig

Gloves (If Wanted)

2 Pieces of String ~ 1 Meter Long

Lab Handout Day 2

Pen / Pencil



The digestive system of mammals consists of;

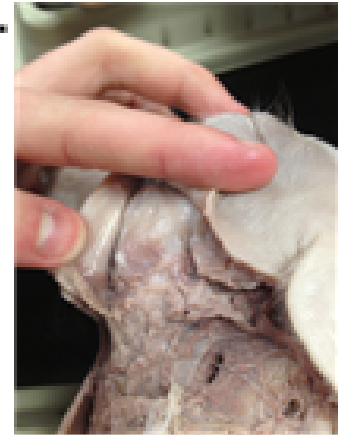
Digestive Tract:

mouth
oral cavity
pharynx
esophagus
stomach
small intestine
large intestine
rectum
anus

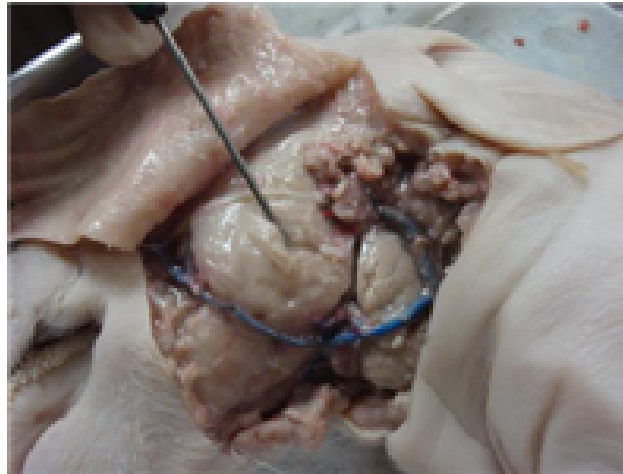
Other Associated Structures / Organs / Glands:

salivary glands
gall bladder
liver
pancreas

Carefully lay the pig on one side in your dissecting pan and cut away the skin from the side of the face and upper neck to expose the masseter muscle. Take care to only cut away skin and not the features underneath.

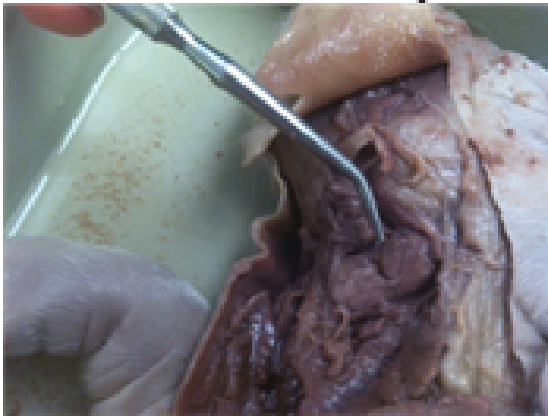


Masseter

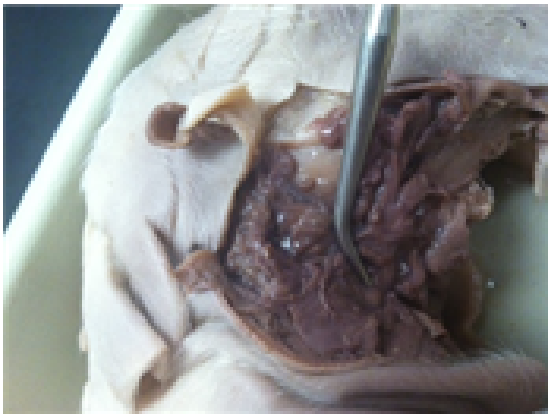


This muscle works the jaw, lymph nodes, and salivary glands.

There are 3 pairs of salivary glands.



Parotid gland: the largest of the three salivary glands. It is next to the masseter muscle. You will have to clear away connective tissue. It looks like two circles joined together.



Mandibular gland: under the parotid gland. Not to be confused with the small oval lymph nodes in the region.

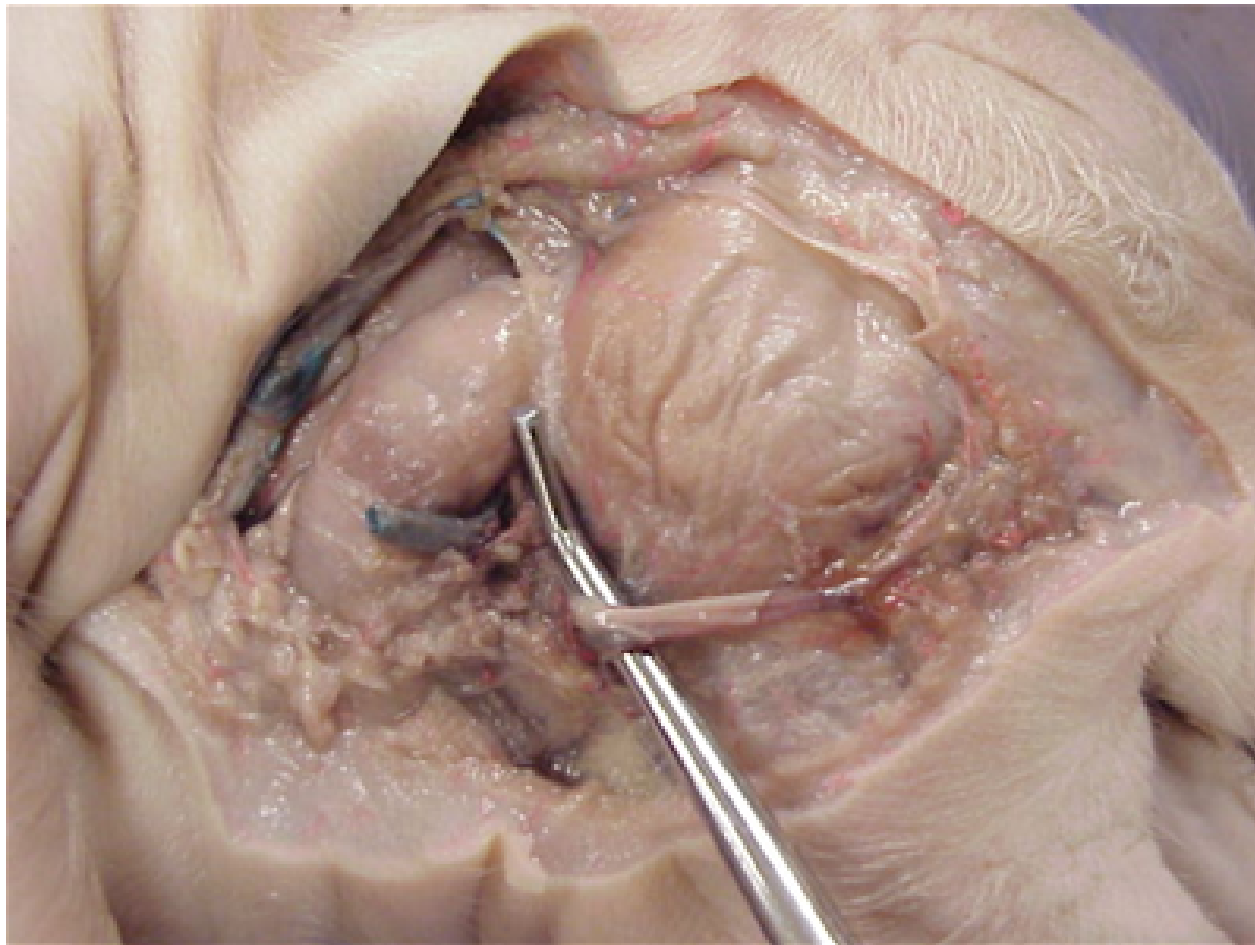
Sublingual gland: long, slender, and difficult to locate (so don't bother).

Salivary glands produce prodigious amounts of saliva (over 1 liter a day in humans).

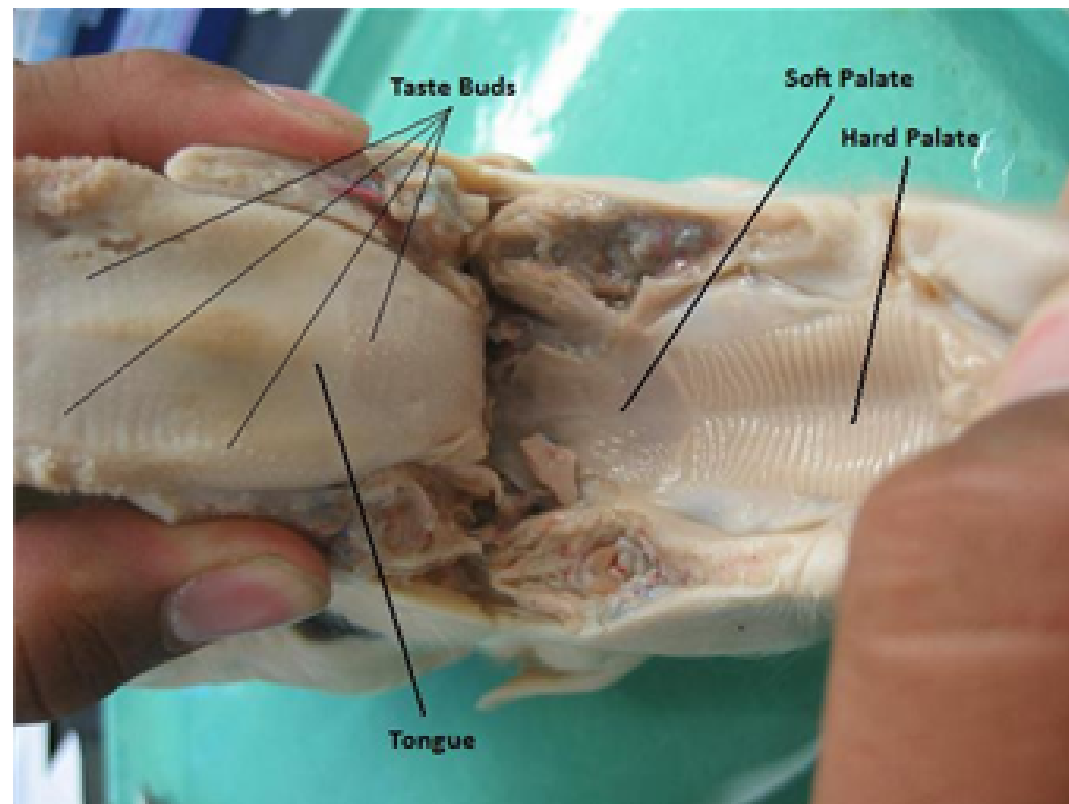
Saliva contains:

- water for moistening food
- mucus (mucin) for lubricating food and binding it into a bolus
- salivary amylase to start the breakdown of starch or acidic food in the mouth
- antibacterial agents to kill bacteria in the mouth

Keep an eye out for
facial nerves too!

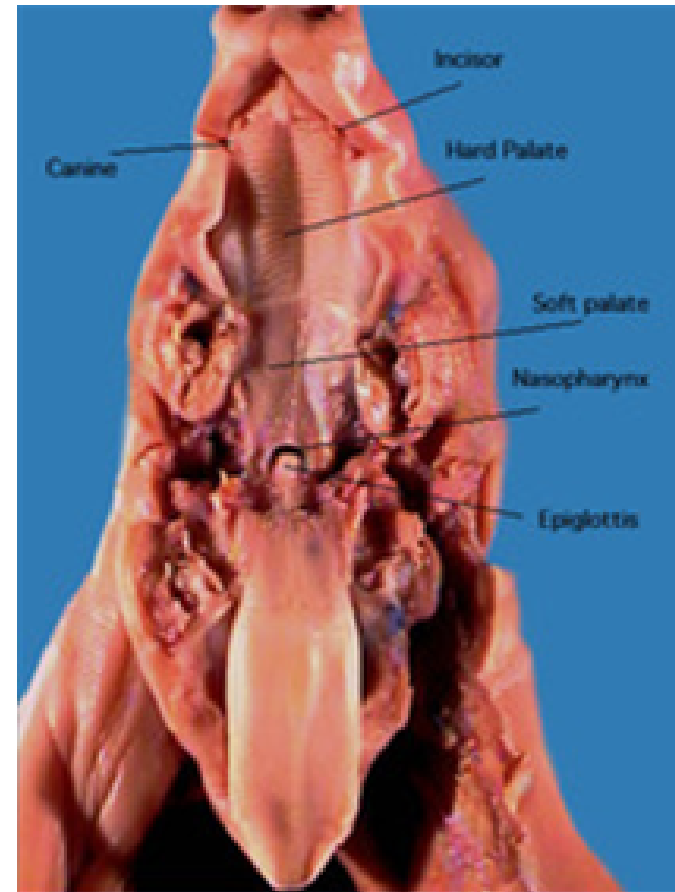
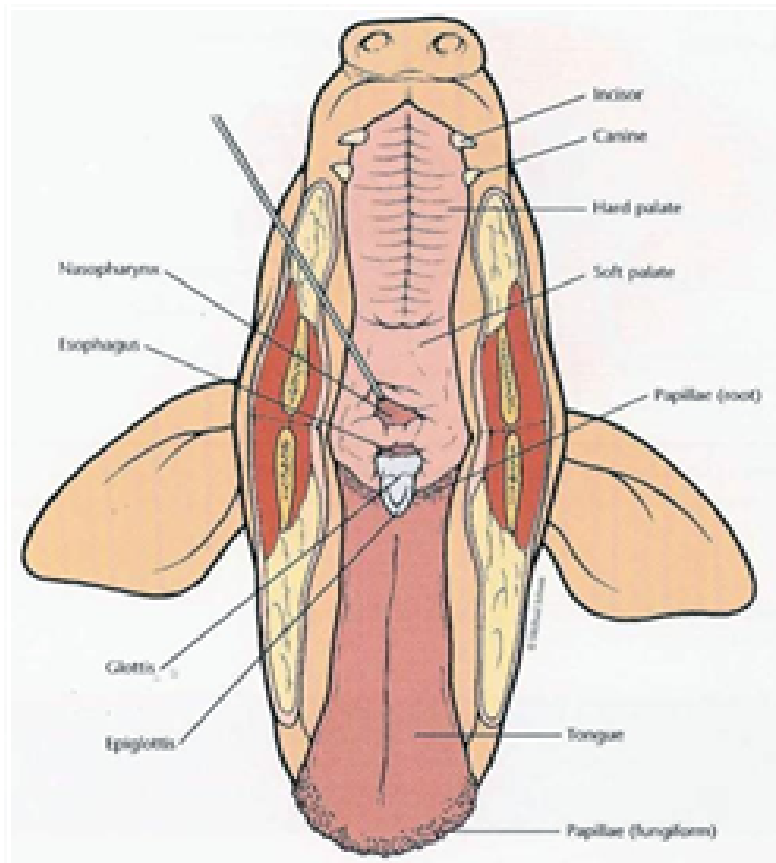


First, examine the tongue. Note the papillae. These provide friction for food handling and contain taste buds.



Then, locate the hard and soft palate. The hard palate contains bony ridges and is very rigid (separates the oral cavity from the nasal cavity), the soft palate is mostly soft muscle tissue.

Next, examine the teeth of the pig. Canine teeth are longer for tearing food, while incisor are shorter and used for biting. Pigs are omnivores, eating plants and animals.



Like all young mammals, fetal pigs have milk teeth (baby teeth) that are later replaced by permanent teeth.

Find the epiglottis. The epiglottis is the flap that covers the trachea when swallowing so food doesn't get into the lungs.



Move the epiglottis forward and stick the probe down the opening. This opening is the start of the esophagus.

Now we will start to look at the internal anatomy of the digestive system. First, watch the procedure, then we will start cutting.

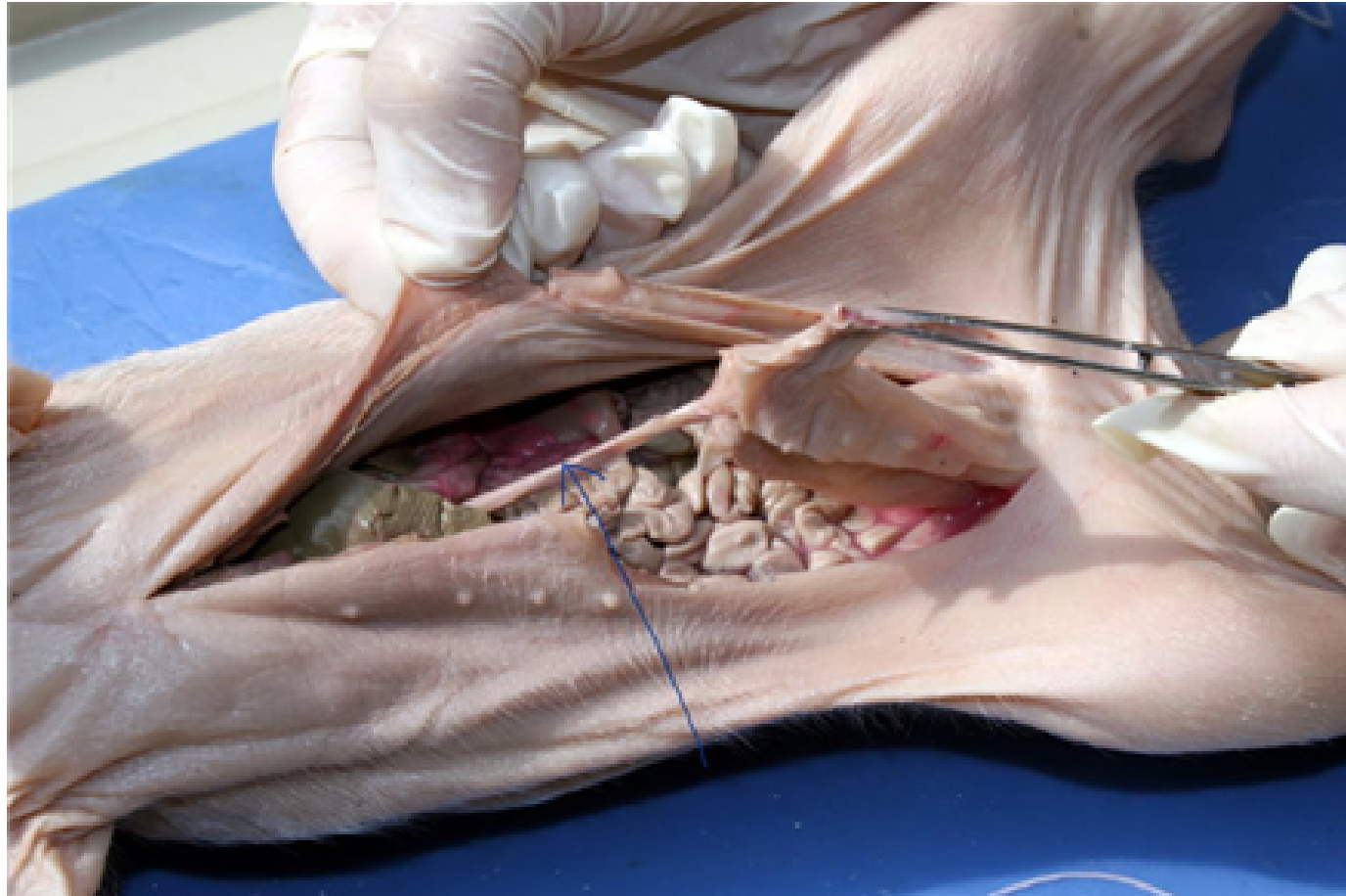


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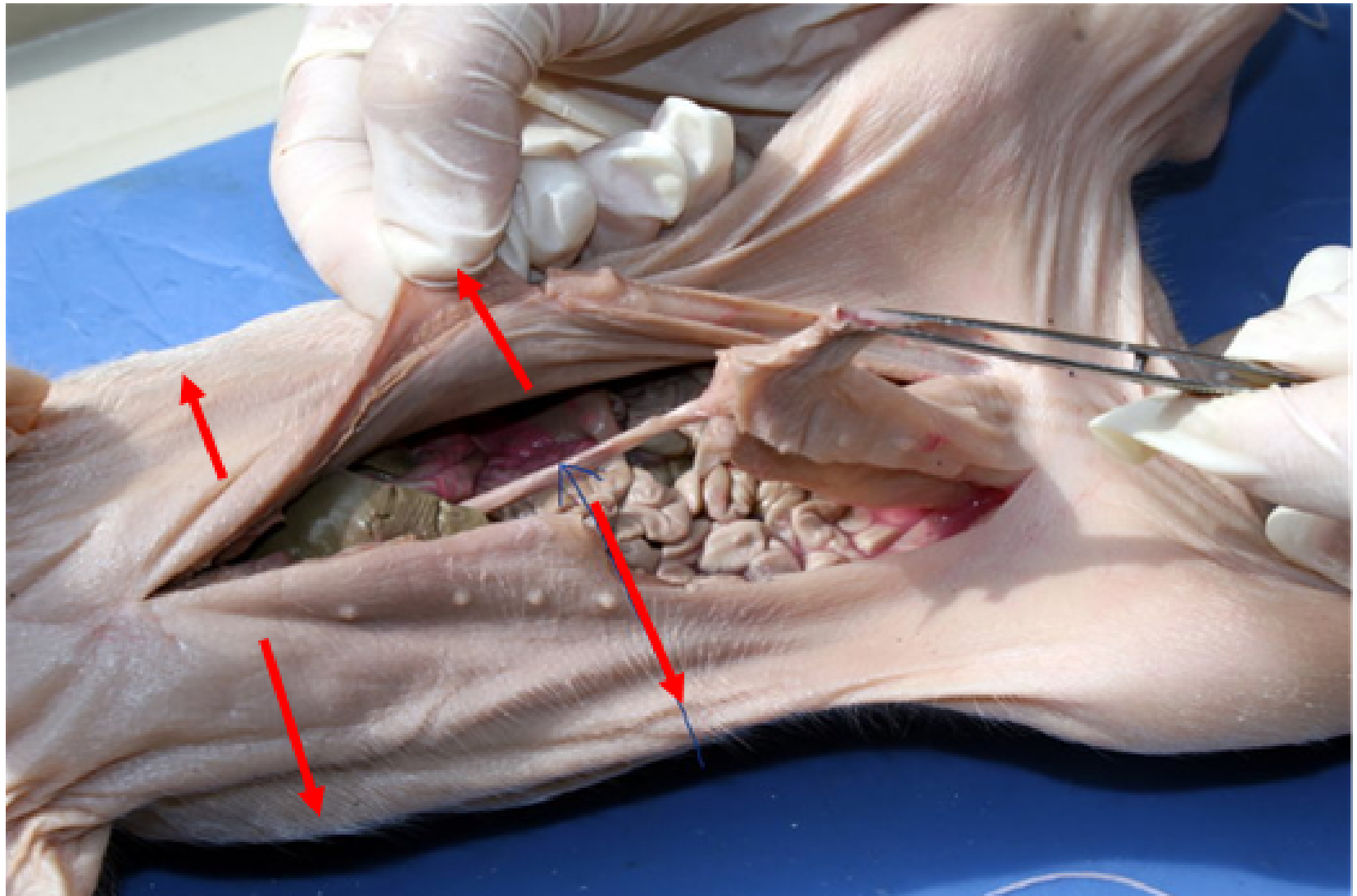


Start your incision around the sternum and cut up through the chin. Then, cut from each extremity around the umbilicus (not through). Pull back the skin and muscle so that you can eventually expose the intestines.

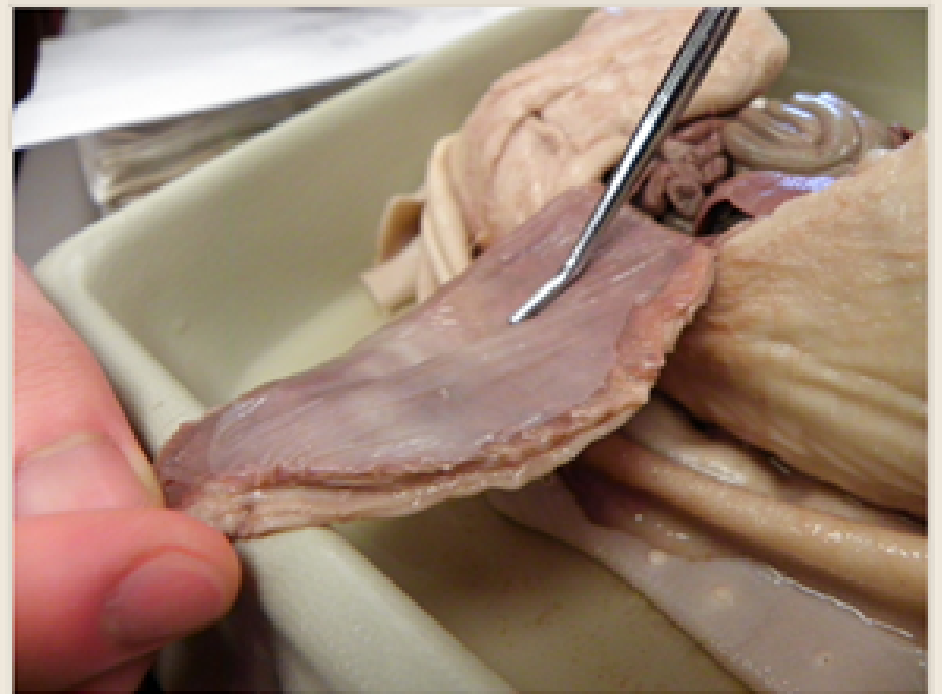
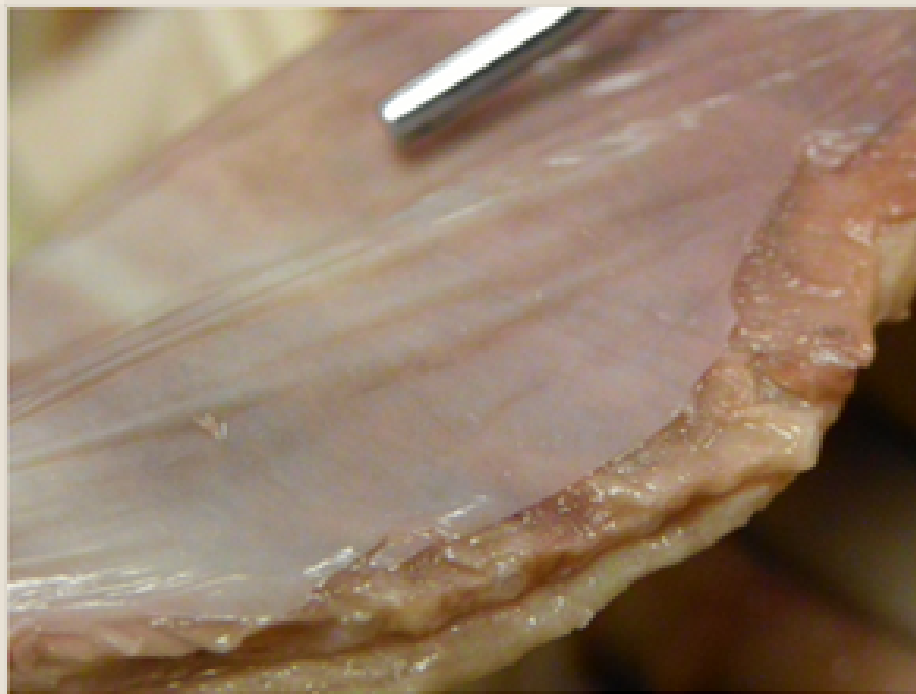
Pull the skin back around the umbilicus. Locate the vein that connects the umbilical cord. This is called the umbilical vein. Cut the umbilical vein to allow us to pull the flap of skin backwards away from the organs.



Next, make two perpendicular incisions on each side to create flaps to see the organs better.

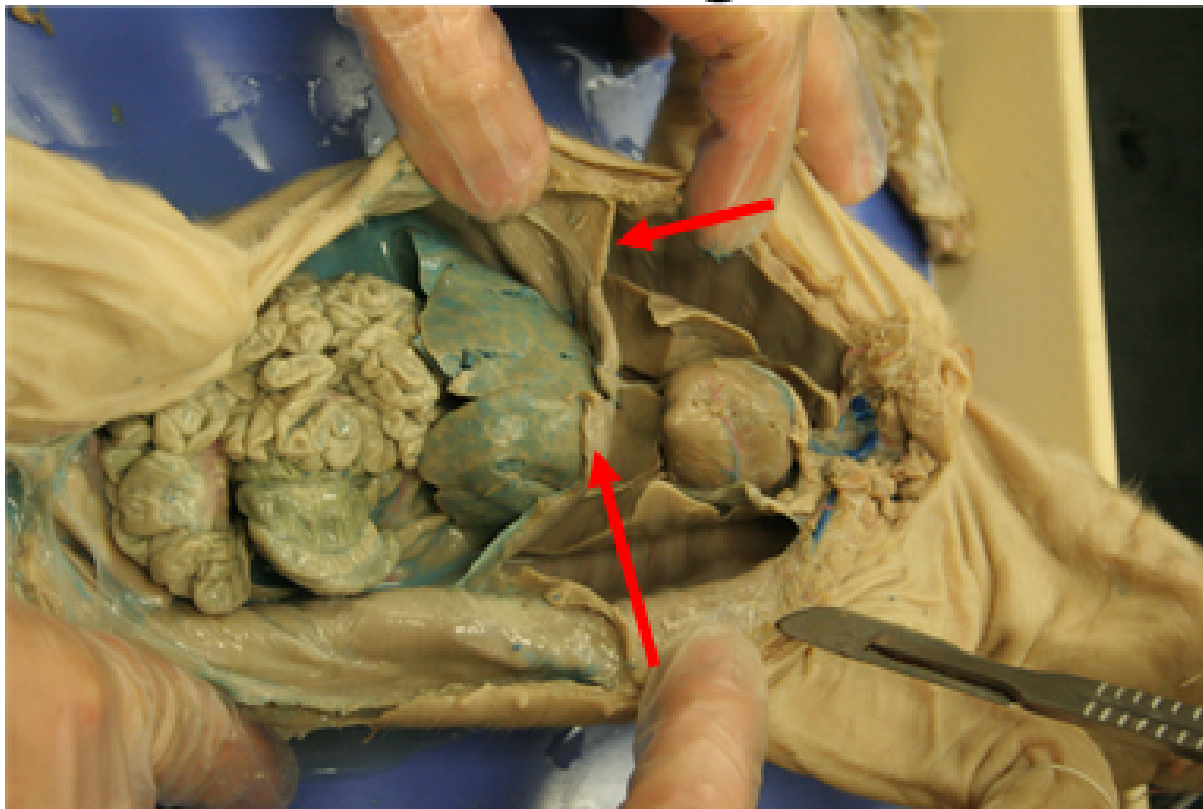


Inside of the flaps of skin that you just cut, try to locate the peritoneum (mesentery). The purpose of the peritoneum is to protect from spreading diseases to other parts of the body and to prevent friction when organs slide along one another.

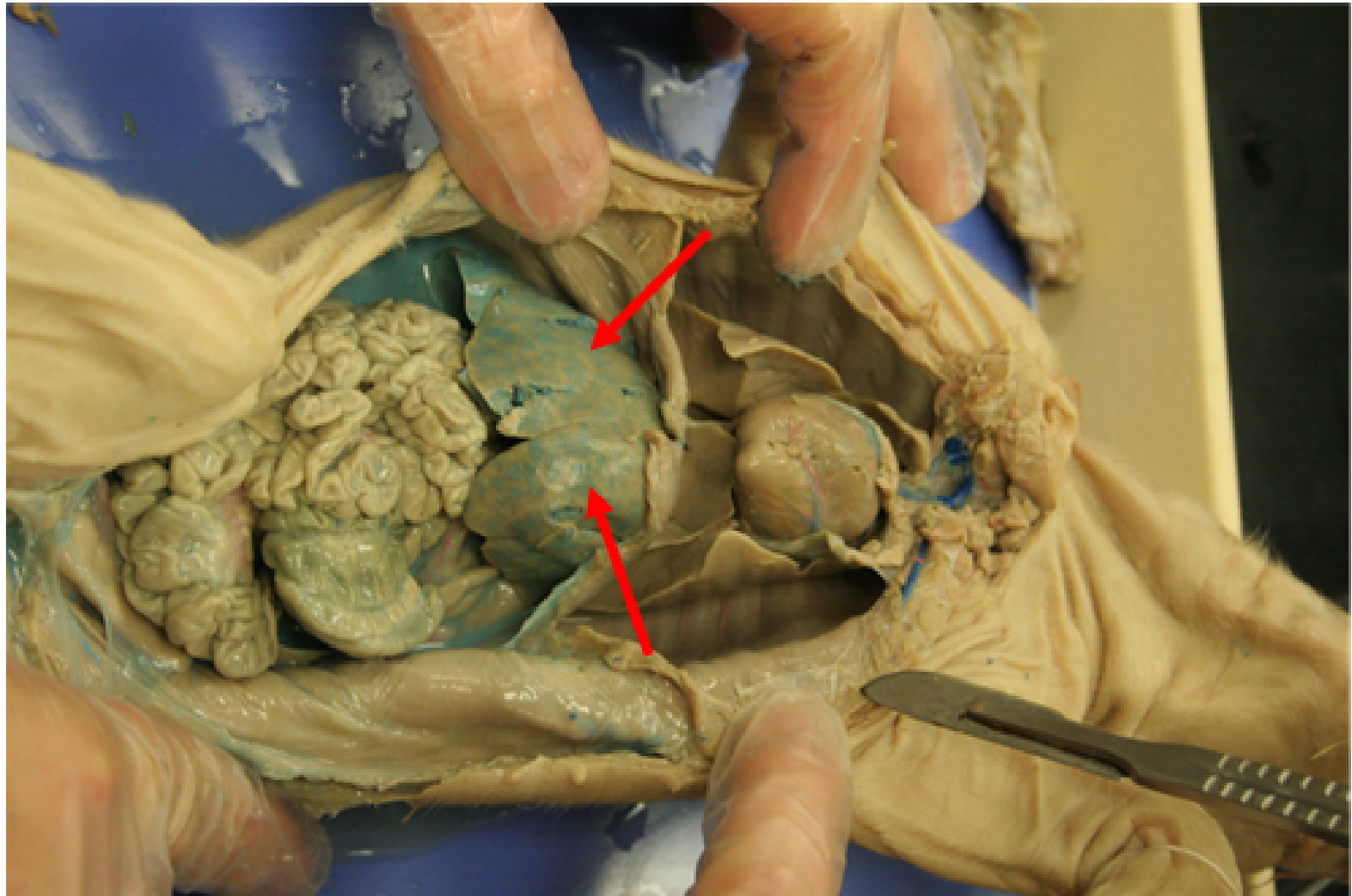


Now that the abdominal cavity is exposed, look for the following.

Find the diaphragm. This muscle divides the thoracic and abdominal cavity and is located near the ribcage. The diaphragm aids in breathing.



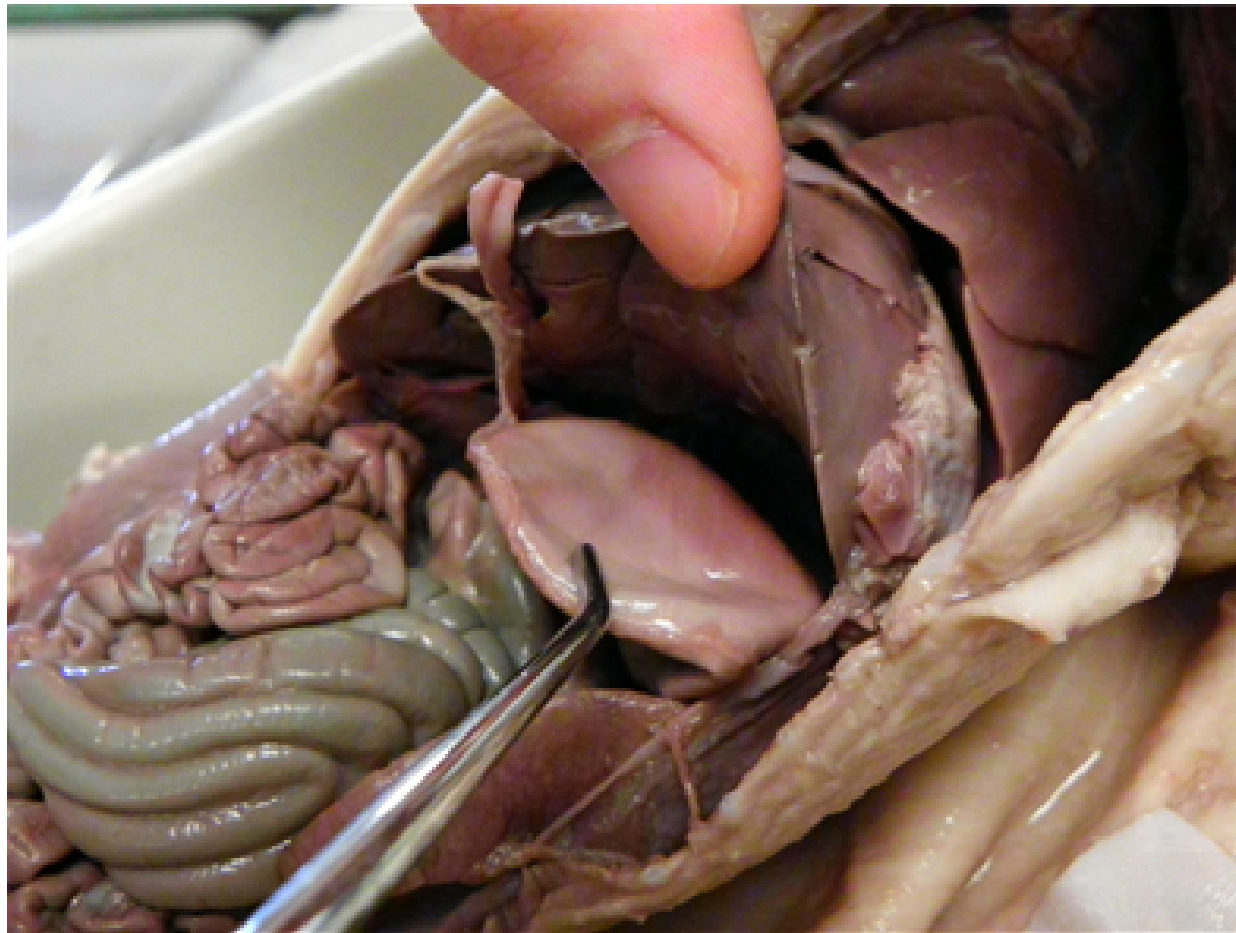
Locate the liver. This structure is lobed and is the largest organ in the body. The liver is responsible for making bile for digestion.



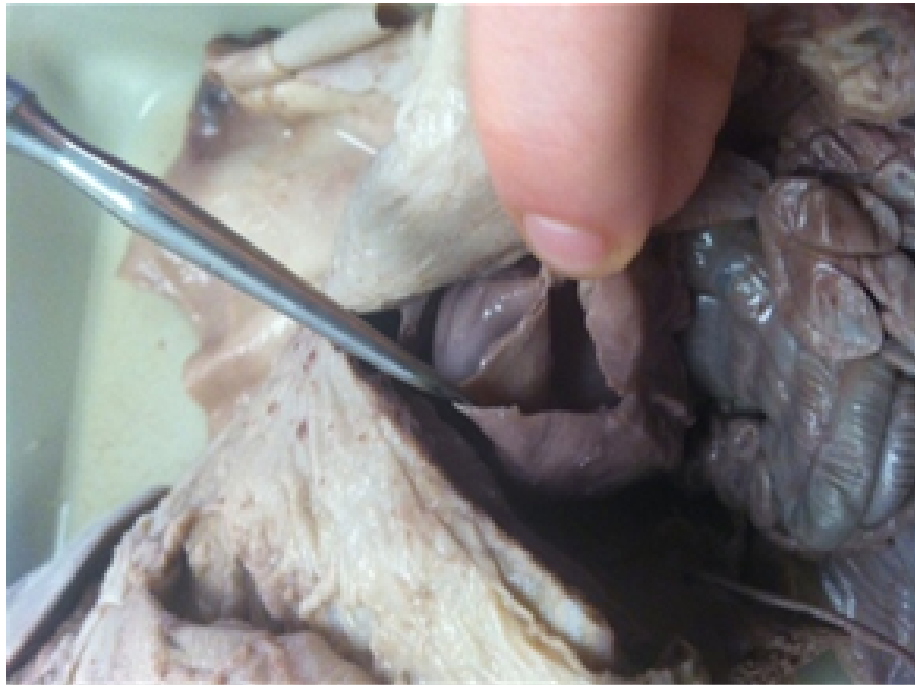
Locate the gall bladder. This greenish organ is located underneath the liver; the bile duct attaches the gall bladder to the duodenum. The gall bladder stores bile and sends it to the duodenum, via the bile duct.



Locate the stomach. This is a pouch shaped organ that rests just underneath and to the pig's left. At the top of the stomach, you'll find the esophagus. The stomach is responsible for churning and breaking down food.



At each end of the stomach are valves that regulate food entering and leaving the stomach. At the esophagus is the cardiac sphincter valve, and at the duodenum is the pyloric sphincter valve. Locate the sphincter and rugae by viewing the inside of the stomach by slicing it open lengthwise.



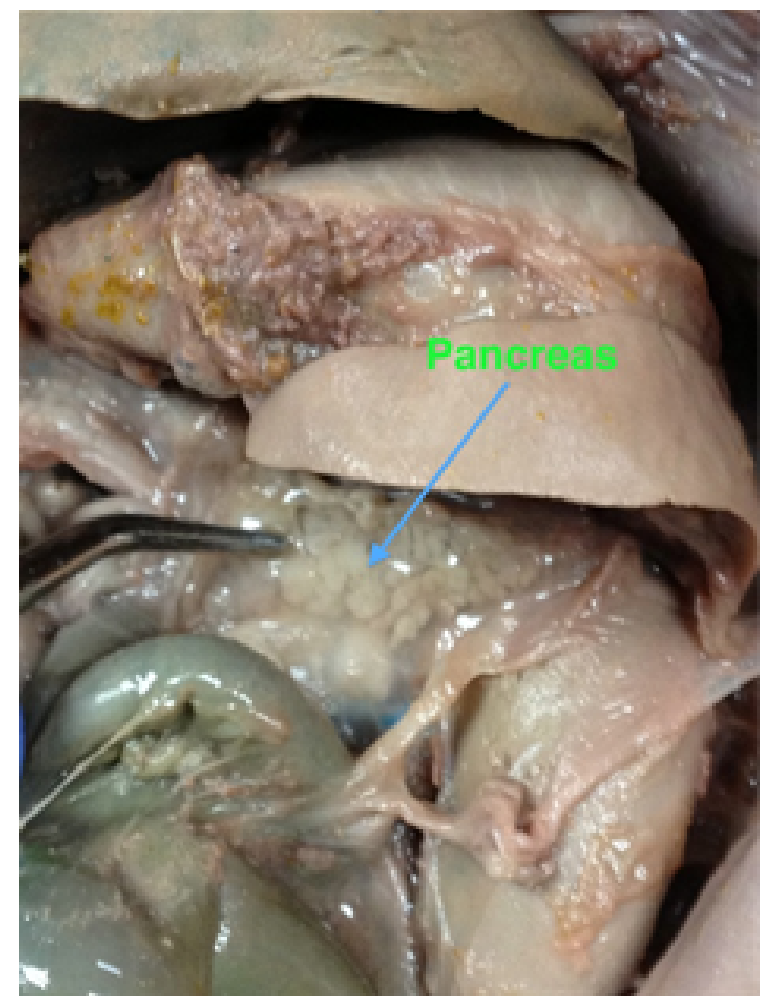
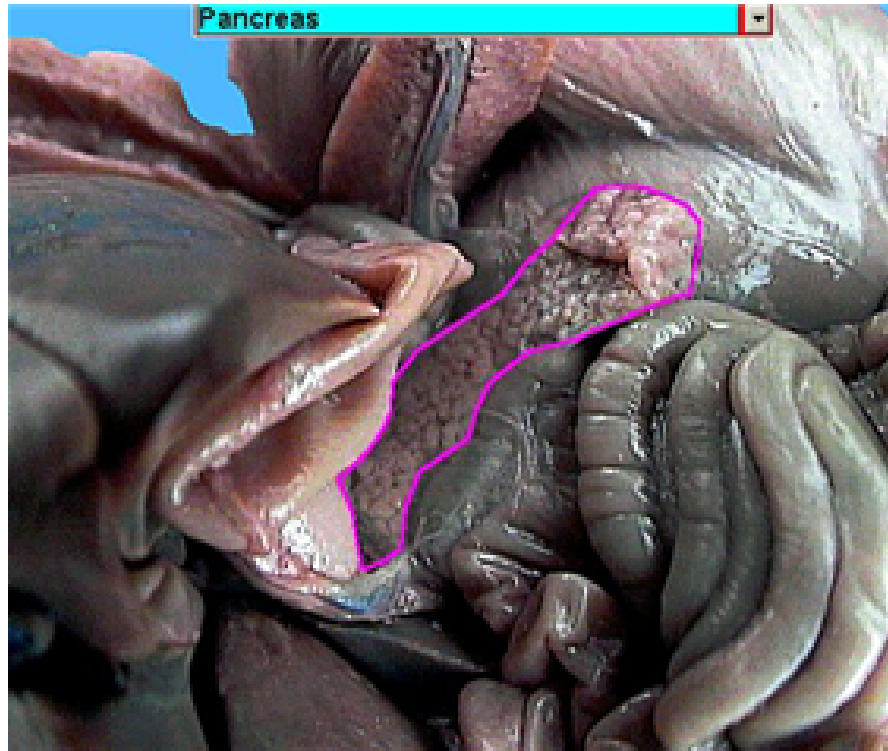
It may be difficult to remove the stomach but you can try.

Locate the small intestine. The stomach leads to the small intestine, which is composed of the duodenum (straight portion just after the stomach) and the jejunum (curly part) and ileum. Look at the mesentery that holds the jejunum together.

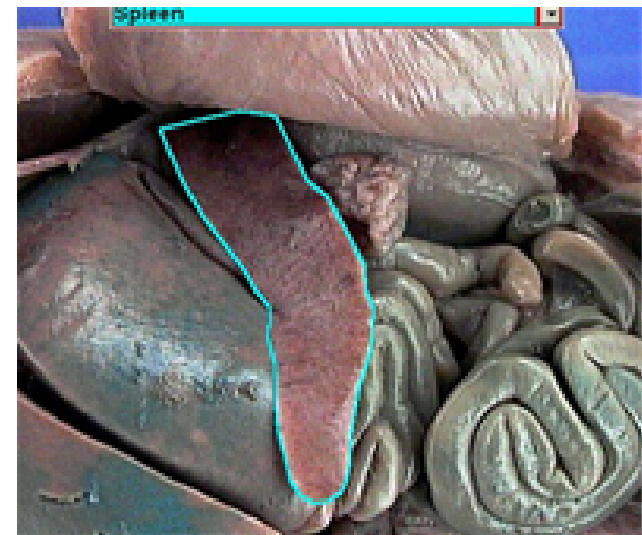
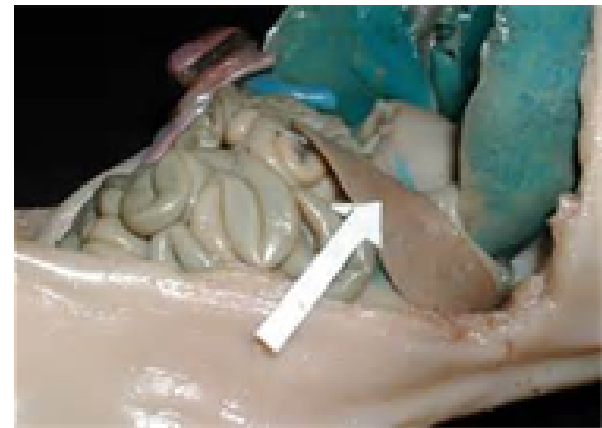


P.S. Fetal pig's small intestine on average reaches 10.2 feet.

Locate the pancreas. The pancreas is a bumpy organ located along the underside of the stomach, a pancreatic duct leads to the duodenum. The pancreas makes insulin, which is necessary for the proper uptake of sugars from the blood



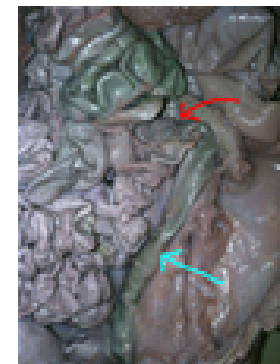
Locate the spleen. The spleen is a flattened organ that lies across the stomach and toward the extreme left side of the pig. The spleen stores blood and is not part of the digestive system. On the underside of the spleen, locate the splenic artery.



Locate the large intestine. This is the organ that sucks out water from the chyme. Note how the large intestine looks different from the human's large intestine.

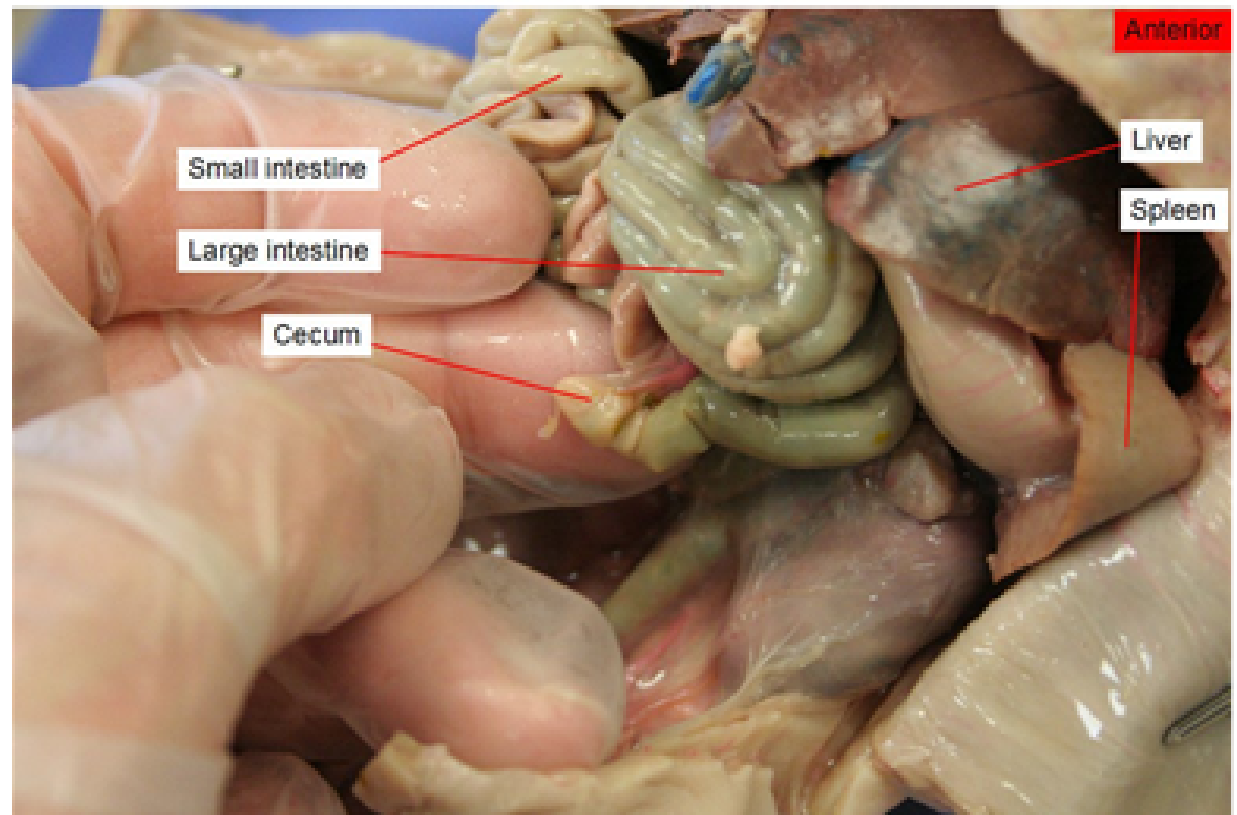


Instead of an ascending colon, fetal pigs have a spiral colon and the **transverse** colon is super duper short. There is still a **descending** colon.



Locate the large intestine and find the cecum. At the end of the ileum, where it widens to become the large intestine, a "dead-end" branch is visible. This is the cecum. The cecum helps the pig digest plant material.

The cecum is a blind pouch where the small intestine joins the large intestine. It houses bacteria used to digest plant materials such as cellulose. The cecum is large in herbivores but much of it has been lost during evolution in humans. The appendix in humans is the evolutionary remains of a larger cecum in human ancestors.



The large intestine can be traced to the rectum. The rectum lies toward the back of the pig and will not be moveable. The rectum opens to the outside of the pig, or the anus. The large intestine reabsorbs water from the digested food, any undigested food is stored in the rectum as feces.

