

A & P I (BIO101) FETAL PIG DISSECTION HANDOUT

I. EXTRENAL FEATURES OF A FETAL PIG

The figure below shows the external features of a fetal pig. Quickly take note of these features before proceeding.

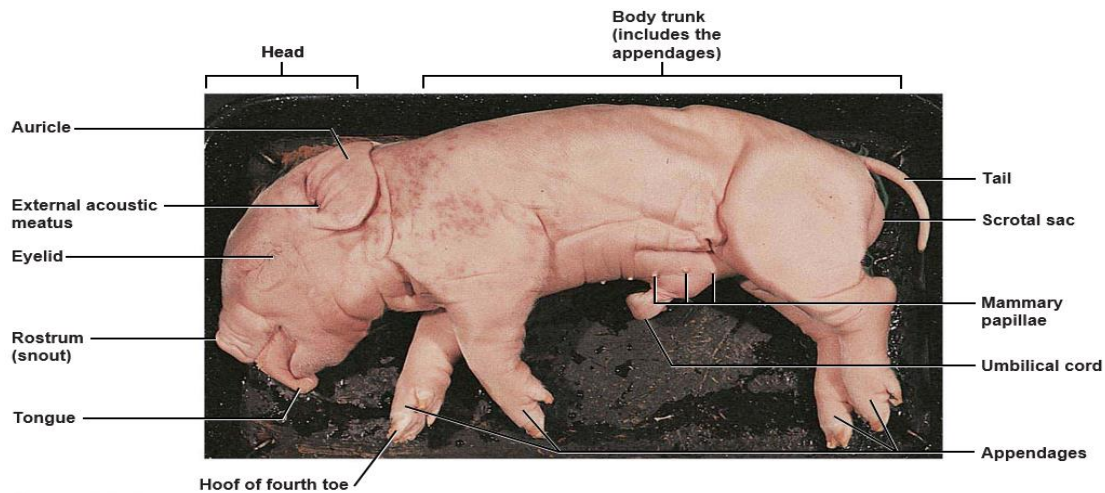


Figure. D1. 1 External features of a fetal pig, lateral aspect. (Figure from Marieb's Human A&P Lab manual, fetal Pig Version 13th Ed., 2019)

The figure below will help you determine the sex of your fetal pig.

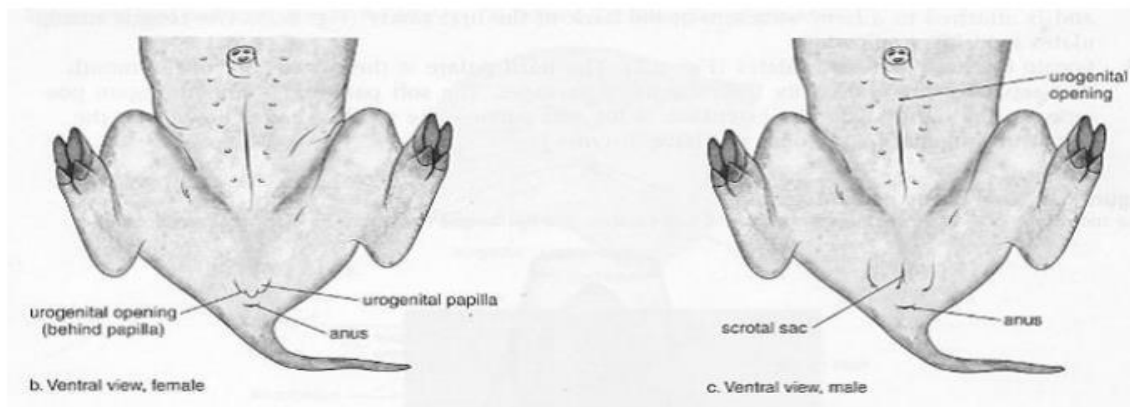


Figure. 1. Fetal pig Sexes. (b) Female. (c) Male (Figure from <http://binglevet.com/fetalpig/>)

Determine the sex of your pig by looking for the **urogenital opening**. The urogenital opening is an opening to both the urinary and reproductive system. The urogenital opening is located close to the anus and behind urogenital papillae on **females**. Females have urogenital papillae present near the urogenital opening. **Males** do not have urogenital papillae, rather males have

a urogenital opening located under the umbilical cord. Both male and female pigs have mammary papillae. Males will also have a scrotal sac which houses the testes. The testes may or may not be present inside of scrotal sac depending on age of a fetal pig (see figure 1).

II. BASIC ANATOMICAL TERMS:

The figure below depicts the use of some of the directional anatomical terms and how they can be used with the fetal pig. Take one part at a time (as reference) and describe another part relative to the part you choose to start with. For example, if I choose the tail as my reference, I can say that the ears are anterior to the tail. But if I choose the ears as my reference, then I can say the tail is posterior to the ears. Please note that the terms anterior and posterior are used differently with the human organism (Refer to Figure 1.2 in Marieb's lab manual). In humans anterior =Ventral, posterior = Dorsal, Superior =Cephalad and Inferior = Caudal. These differences are due to the fact that humans are bipedal.

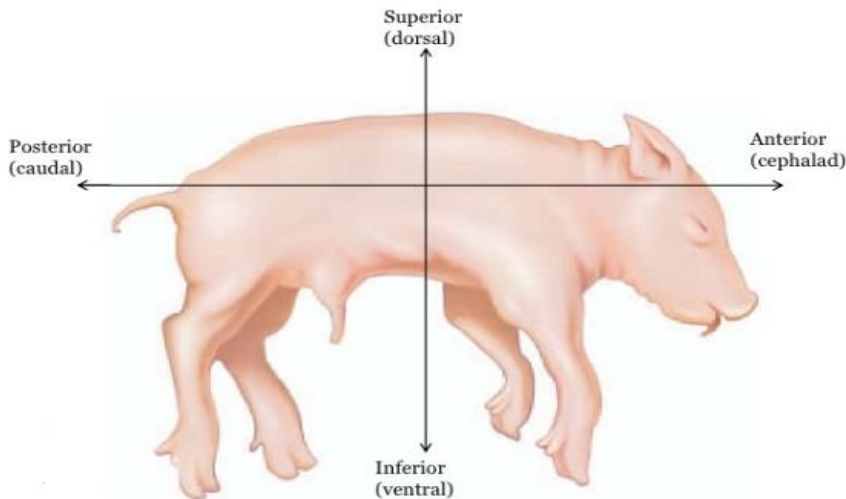


Figure. 2. Directional Anatomical terms use with fetal pig.

Below is a list of directional anatomical terminology that you can practice using:

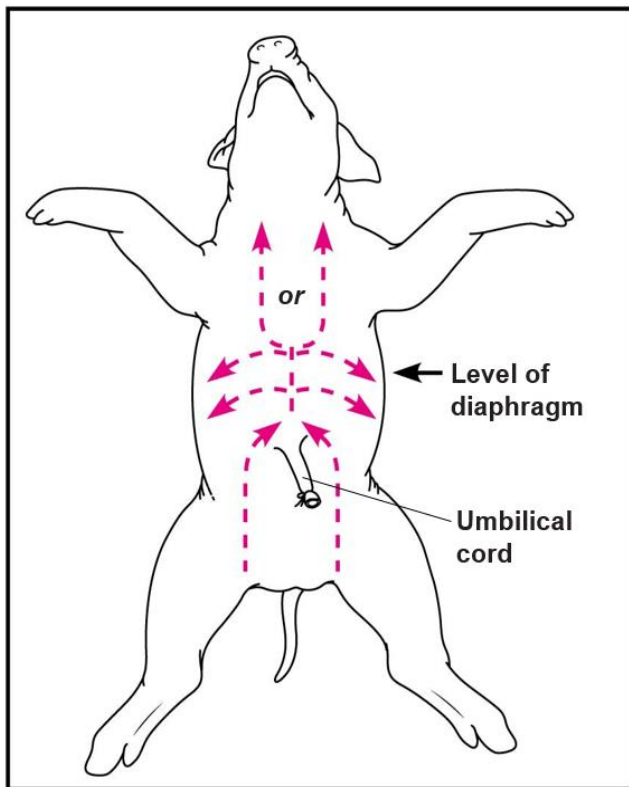
- **Anterior:** refers to/toward the head of a specimen. If a structure is anterior, it is closer to the head.
- **Posterior:** refers to/ toward tail end; if a structure is posterior to another, then it is closer to the tail.
- **Dorsal:** refers to the back side.
- **Ventral:** is the belly side. It is opposite the dorsal side.
- **Lateral:** Away from the midline.

- **Medial:** Toward the midline.
- **Superior:** Toward the ventral surface.
- **Inferior:** Toward the dorsal surface.
- **Deep:** Further away from the skin.
- **Superficial:** Structures located toward the skin.

III. DISSECTION OF FETAL PIG

Follow link for a [Great youtube fetal pig dissection Video](#) (Runtime 5:21) for a visual demonstration of how a fetal pig is dissected.

The figure below can be used as a guide to making the initial incisions in the fetal pig.



(a)

Figure. D4. 1 (a) Incision guide for opening the ventral body cavity. [Figure from Marieb's Human A&P Lab manual, fetal Pig Version 13th Ed., 2019]

IV. IDENTIFICATION OF ORGANS AND ORGAN SYSTEMS IN THE VENTRAL BODY CAVITY OF FETAL PIG.

The figure below can be used as an aid in the identification of ventral body cavity (thoracic and abdominal) organs in the fetal pig.

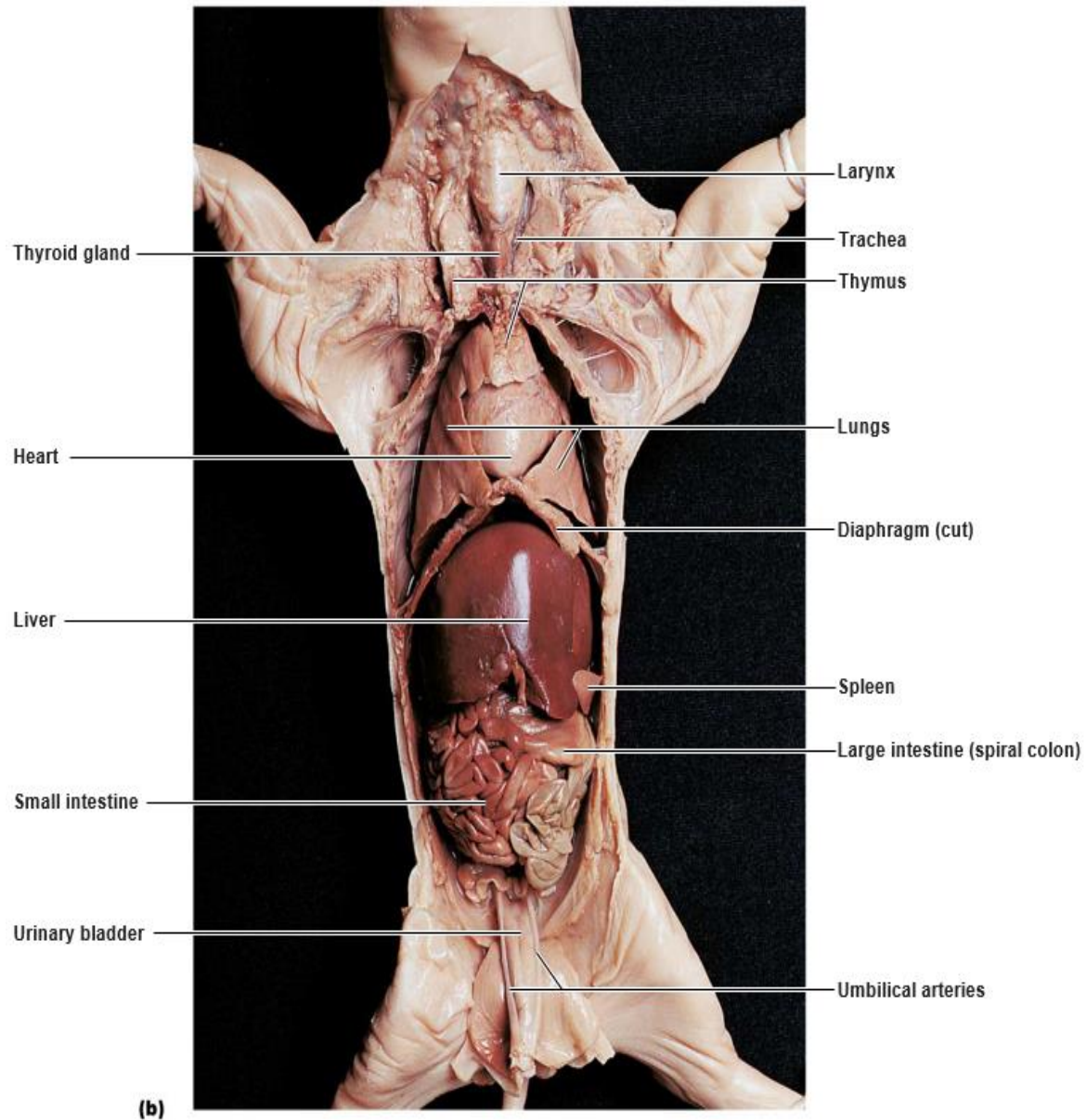


Figure. D4. 1 (b) photograph of opened ventral cavity. [Figure from Marieb's Human A&P Lab manual, fetal Pig Version 13th Ed., 2019]

Table 2.1 below (From Marieb’s A & P lab manual, fetal Pig Version 13th Ed., 2019) lists organ systems, their major component organs and their function. The human organism is composed of specialized cells organized into tissues that have different functions. Tissues make up organs, which together make up organ systems. As you perform your fetal pig dissection, locate the organs shown in figure D4.1 (b) above and use the information in table 2.1 below to place the organs in their correct organ system for question # 5 in the worksheet (at the back of fetal pig dissection handout).

Table 2.1 Overview of Organ Systems of the Body		
Organ system	Major component organs	Function
Integumentary (Skin)	Epidermal and dermal regions; cutaneous sense organs and glands	<ul style="list-style-type: none"> Protects deeper organs from mechanical, chemical, and bacterial injury, and from drying out Excretes salts and urea Aids in regulation of body temperature Produces vitamin D
Skeletal	Bones, cartilages, tendons, ligaments, and joints	<ul style="list-style-type: none"> Body support and protection of internal organs Provides levers for muscular action Cavities provide a site for blood cell formation
Muscular	Muscles attached to the skeleton	<ul style="list-style-type: none"> Primary function is to contract or shorten; in doing so, skeletal muscles allow locomotion (running, walking, etc.), grasping and manipulation of the environment, and facial expression Generates heat
Nervous	Brain, spinal cord, nerves, and sensory receptors	<ul style="list-style-type: none"> Allows body to detect changes in its internal and external environment and to respond to such information by activating appropriate muscles or glands Helps maintain homeostasis of the body via rapid transmission of electrical signals
Endocrine	Pituitary, thymus, thyroid, parathyroid, adrenal, and pineal glands; ovaries, testes, and pancreas	<ul style="list-style-type: none"> Helps maintain body homeostasis, promotes growth and development; produces chemical messengers called hormones that travel in the blood to exert their effect(s) on various target organs of the body
Cardiovascular	Heart, blood vessels, and blood	<ul style="list-style-type: none"> Primarily a transport system that carries blood containing oxygen, carbon dioxide, nutrients, wastes, ions, hormones, and other substances to and from the tissue cells where exchanges are made; blood is propelled through the blood vessels by the pumping action of the heart Antibodies and other protein molecules in the blood protect the body
Lymphatic/Immunity	Lymphatic vessels, lymph nodes, spleen, thymus, tonsils, and scattered collections of lymphoid tissue	<ul style="list-style-type: none"> Picks up fluid leaked from the blood vessels and returns it to the blood Cleanses blood of pathogens and other debris Houses lymphocytes that act via the immune response to protect the body from foreign substances
Respiratory	Nasal passages, pharynx, larynx, trachea, bronchi, and lungs	<ul style="list-style-type: none"> Keeps the blood continuously supplied with oxygen while removing carbon dioxide Contributes to the acid-base balance of the blood via its carbonic acid–bicarbonate buffer system
Digestive	Oral cavity, esophagus, stomach, small and large intestines, and accessory structures including teeth, salivary glands, liver, and pancreas	<ul style="list-style-type: none"> Breaks down ingested foods to smaller particles, which can be absorbed into the blood for delivery to the body cells Undigested residue removed from the body as feces
Urinary	Kidneys, ureters, bladder, and urethra	<ul style="list-style-type: none"> Rids the body of nitrogen-containing wastes including urea, uric acid, and ammonia, which result from the breakdown of proteins and nucleic acids Maintains water, electrolyte, and acid-base balance of blood
Reproductive	<p>Male: testes, prostate gland, scrotum, penis, and duct system, which carries sperm to the body exterior</p> <p>Female: ovaries, uterine tubes, uterus, mammary glands, and vagina</p>	<ul style="list-style-type: none"> Provides germ cells called sperm for perpetuation of the species Provides germ cells called eggs; the female uterus houses the developing fetus until birth; mammary glands provide nutrition for the infant

V. NOTES

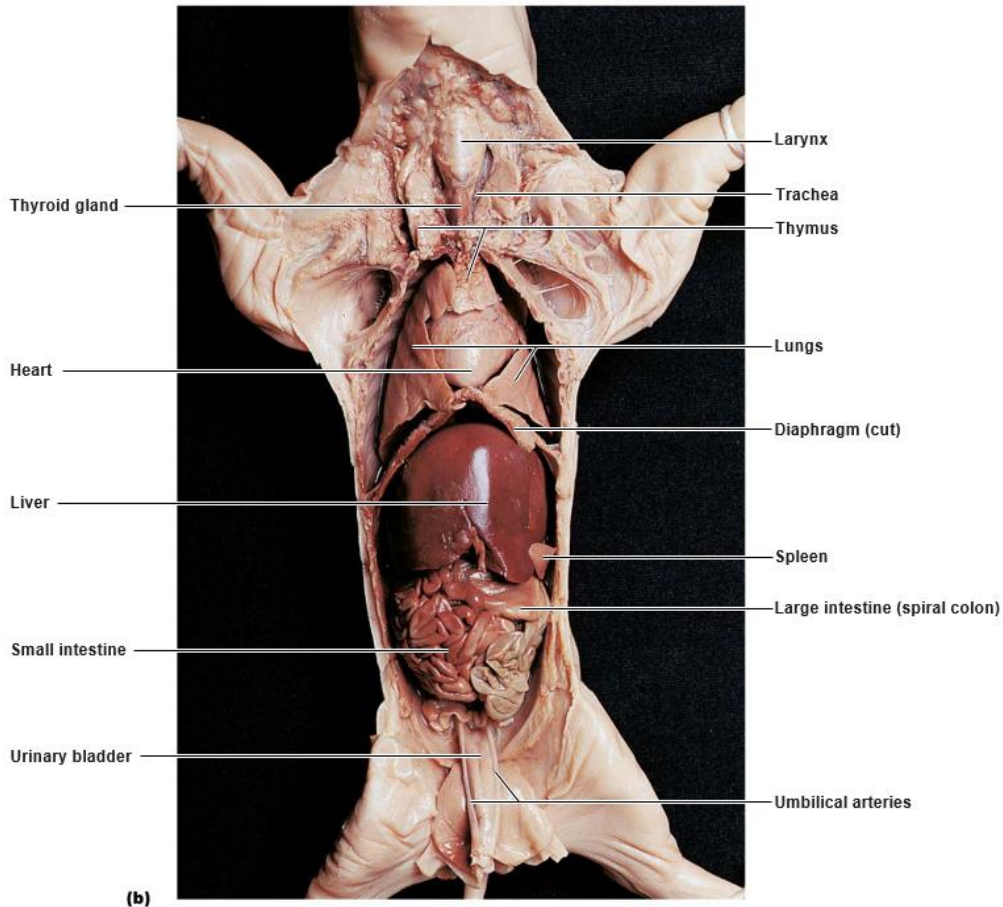
The notes below may be help with locating some organs that may be hidden in the ventral body cavity.

- **Arteries** are stiffer and lighter in color than **veins**. If injected with latex, the arteries are red in color, veins are blue. Once the pig is open you will pull the umbilical cord and cut the umbilical vein running through the umbilical cord and attaching it to the abdomen. This allows you to pull back the flap of skin and tissue around the umbilical cord to fully expose lower abdominal organs. Avoid cutting other blood vessels as much as possible.
- The **liver** is the largest organ in the abdominal cavity.
- Located underneath the liver is the **gallbladder**. Gently lift the liver to view the **gallbladder**. The gallbladder which stores and concentrates bile is green in color.
- Find the **stomach** dorsal and to the left of the liver. Gently push the liver to the side to view the **stomach**, which looks like a sac or pouch. The **esophagus** is connected to the stomach, superiorly,
- **Pancreas** is located between the stomach and small intestine. It is a light colored diffuse gland. You must move the spleen aside and lift the stomach up in order to view the pancreas.
- Running along the dorsal wall of the body cavity are bean-shaped organs known as the **kidneys**. They are located on both sides of the spine.

WORKSHEET

Please respond to all the questions below:

1. The sex of my fetal pig is _____.
2. The hard palate feels _____.
3. The soft palate feels _____.
4. Use the most fitting anatomical terminology to fill the blanks below as related to the fetal pigs.
 - i. The mammary papillae are _____ to the spine.
 - ii. The skin is _____ to the small intestines
 - iii. The hoofs are _____ to the knee.
 - iv. The spine is _____ to the kidneys
5. In the figure below, Write (in parenthesis) beside each identified organ the organs system to which the organ belongs. You can do this part after clean up.



6. The largest organ in the abdominal cavity is the _____.

References and Urls.

Marieb, E. N., Smith, L. A. Human Anatomy & Physiology (Pig Version); 13th Ed., Pearson Education, 2019.

<http://binglevet.com/fetalpig/>

<https://www.youtube.com/watch?v=BwjLIYOWtWQ>

Updated: 5/07/18