

BIO 111 - Laboratory #1: Digestion (Part 1) and External Fetal Pig Anatomy

- **Assigned pages:** Mader, S., et al. 2008. Inquiry of Life. pp. 149-152, 157, 159-61, 162-63, and 172.
 - ✓ Fill in Table 12.1
 - ✓ Follow all procedures for working with your fetal pig
 - ✓ **Dissection kit, gloves and goggles are required**
 - ✓ **The Lab Manual is required for ALL classes**

I. Digestion:

1. GOALS - Digestion:

At the end of Lab 1 you should be able to fulfill the objectives and define the terms for Digestion; quiz questions will be based on this material.

Objectives - at the end of laboratory #1 you should be able to:

1. **summarize** starch digestion by salivary amylase;
2. **explain** how iodine and Benedict's reagent indicate whether starch digestion has occurred;
3. **state** how starch digestion is affected by the following:
 - 1.) presence of salivary amylase;
 - 2.) temperature; and
 - 3.) length of time for the reaction.

Key terms you need to know or building your “scientific vocabulary”:

digestion	maltose (in the digestion reaction)
hydrolytic reaction	iodine test vs. Benedict's Reagent test
salivary amylase	experimental variable vs. control
starch (in the digestion reaction)	"lock and key" model of enzymatic action

2. Experimental Procedure (section 12.1):

- 1.) **Preparation: LABEL all tubes AT TOP (eight tubes) and MARK 1cm and 2 cm on all tubes.**
- 2.) **Bottles with solutions are located on every other table; please, share and return the bottles.**
- 3.) **pp. 149 - 150:** Read and answer questions on p. 150
- 4.) **p. 150 (bottom) - p. 152 (top):**
 1. **Read and fill in** the "Type of Test" (column 4) on Table 12.1
NOTE: CHANGE ALL 30 minute times to 20 minutes (this may result in partial digestion)
 2. Follow the experimental procedure described in steps 1 through 6 and fill in Table 12.1 with the time you start and end a step, your results and explanation for each result.
SKIP: questions after step 6 (p. 151)
 3. **Remember to do the tests for tubes 1 and 2 immediately.** Tube 1 is tested for starch using iodine and tube 2 is tested for maltose using Benedict's Reagent. Similarly, tubes 3 and 4 are a pair, tubes 5 and 6 are a pair, and tubes 7 and 8 are a pair.
 4. **p. 152 (top): Answer "Conclusion" questions.**
 5. **p. 157: Answer review questions 1 - 7 and 15 (SKIP: questions 7 - 14)**

II. External Fetal Pig Anatomy including Oral Cavity and Pharynx

1. GOALS - External Pig Anatomy:

At the end of Lab 1 you should be able to fulfill the objectives and define the terms for external fetal pig anatomy, including the structures of the oral cavity and pharynx; quiz questions will be based on this material.

Objectives - at the end of laboratory #1 you should be able to:

1. **state characteristics** shared by all mammals;

2. **determine** whether the fetal pig is male or female; and
3. **explain** what is meant when we say 'the pharynx is at the crossroad for air and food'.

Key terms you need to know or building your “scientific vocabulary”:

1. identify the following external anatomical structures and state their function:

tongue, exterior ear, eyelid, and nose	nipples
wrist and elbow	umbilical cord
digits	urogenital opening (location depends on the sex)
knee and ankle	scrotal sac (males)
shoulder and hip	urogenital papilla (females)
dorsal and ventral	anus
anterior and posterior	head, trunk, and tail

2. identify the following oral cavity and pharynx structures and state their functions:

hard palate and soft palate	glottis and epiglottis
esophagus	tongue
nasopharynx	trachea

2. Dissection - external anatomy observations:

1. Preparation:
 - 1.) Obtain a bag, two pieces of rope, a twist tie, and an ID tag from the side bench.
 - 2.) **LABEL the tag with your last name, class day and time.**
 - 3.) Obtain a fetal pig from your instructor.
2. **pp. 159 - 160** (top): Read general introduction (p. 159) and introduction to 13.1 (p. 160).
3. **pp. 160 - 161:**
 - 1.) Examine your fetal pig and answer the questions.
 - 2.) Identify the sex of your pig and write it on your tag. Locate a group with a fetal pig of the opposite sex; make sure you can identify fetal pigs of each sex.

3. Dissection - oral cavity and pharynx:

1. **Secure your pig** with string (as shown).
2. **Observe** the demonstration for incisions.
2. **pp. 162-163:** Read the 13.2 introduction; follow the steps for examination of the oral cavity (p. 162) and pharynx (p. 163). You should be able to manipulate the epiglottis and clearly see the glottis.

4. STORAGE :

IMPORTANT: You will be using this pig for labs 1 through 6; please, **do the following at the end of each lab class:**

1. place your pig in the bag and expel excess air by flattening the bag against the pig's body; your lab; instructor will tell you where the fetal pigs are to be stored until your next lab class;
2. tie the bag shut and make sure that your name tag is securely attached to this bag;
3. **CLEAN** your dissecting tools and tray; return tray to side bench; and
4. wipe off/clean your goggles, and **WASH YOUR HANDS.**