

Abstract

The switch to online learning at the onset of the COVID-19 pandemic posed many challenges to the laboratory portion of Human Anatomy & Physiology, but has also had a positive impact on the “post-COVID” teaching in our course. Prior to the pandemic, the course utilized human models and cat cadavers in laboratory activities, homework consisted of worksheets and exams were performed during the lab once every 3 weeks. During the pandemic we began working with virtual modeling software of the human body. We continue to use this software because it has allowed us to deliver laboratory unit exams fully online; freeing up face-to-face time for more hands-on laboratory activities. A laboratory activity we have added is a demonstration of the tissue level of organization of the human body using raw chicken quarters. In the week prior to this activity students have studied the microscopic histology of human tissues and noted their anatomical and physiological properties in a chart. It is our observation that students find learning about tissues at the microscopic level abstract, and they have a difficult time transferring this information to further understanding of the human body. In the new “follow-up” activity the students interact with the tissues in a much more tangible way. In groups the students work together to identify and describe the physical characteristics of each tissue type and link this back to the anatomical and physiological properties of that tissue type noted during the prior session. Students also photographed each tissue and add labels. At the conclusion of the activity, students show me their filled-out charts and labeled photographs to get credit for being present in lab. This activity would also lend itself well as an online/at home exercise.

Activity Goals:

- Instructor
 - Provide hands-on laboratory experience.
 - Provide group-learning experience.
 - Strengthen student understanding between anatomy and physiology of tissues.
 - “How does what something is made of (form) relate to what it does (function)?”
- Students
 - Learn names of tissues.
 - Describe physical characteristics of tissues observed at the gross level.
 - Take what they observe at the gross level and relate it back to information about the cellular/microscopic level.
 - Link anatomical information (form) to what we know about their physiology (function).

Instructor and Technician Setup:

- Materials
 - Gloves (*prevention of salmonella infection*)
 - ¼ or ½ chicken part from grocery/butcher (*raw, thawed, and with skin*)
 - Gallon zip bag to store chicken
 - Dissection trays
 - Dissection tools
 - Disinfection solution (*prevention of salmonella infection*) and paper towels
 - Histology lab manual of the tissues for reference for each group
 - Laboratory packet for each student
 - At least one phone/tablet/laptop/device with camera capabilities
 - At least one student team member that can label the captured photos

Excerpts from Laboratory Packet:

Procedure:

- 1) As a group, physically manipulate the chicken to observe the tissues present. **Choose 7 areas of the chicken that are different tissue types to describe in every chart.** Read the “Things to think about” questions in each section below. Refer to the Histology Laboratory Manual provided for each group by the instructor.
- 2) Take photographs of the identified tissues and label the tissues on the photos.
- 3) Fill out the charts included in this activity.
- 4) Show your instructor your completed charts and labeled photographs to get credit for the activity as a lab homework grade.
- 5) Upload your group's labeled photos and photos of your completed charts into the folder on Brightspace (It's a Discussion Board Forum -so we can see each other's submissions).

At the conclusion of lab (*prevention of salmonella contamination*):

- Place chicken back in the bag (share the bag with another group so that each bag has 2).
- Return the bagged chicken to your instructor so that it can be stored in the freezer.
- Place dissection tray in the large sink, rinse, and spray with antimicrobial fluid. Leave it to drip dry at the sink.
- Rinse dissection tools and leave to dry on a paper towel to the side of the sink.
- Wipe entire surface of lab bench with antimicrobial fluid provided.
- Wipe any surfaces or personal articles you may have contaminated (pens, pencils, phones) with the antimicrobial fluid.
- Wash your hands **VERY WELL!**

Results Pages:

(Showing only the top of the tables here)

Tables had 7 rows where students recorded their answers to the prompts.

*This column is the same on every chart

Things to think about:

- What is there in the chicken?
- Can you determine some of the tissue types that are present?
- Can you tell where one tissue type ends, and another begins? How?

Chicken Part*	Tissue Type Identified
---------------	------------------------

Things to think about:

- How do different areas of the chicken feel?
- Are they rigid, flexible, stretchy, thick, thin, oily, watery, dry, hard, soft, rough, smooth?

Chicken Part*	Physical descriptors of the area
---------------	----------------------------------

Things to think about:

- What cells/extracellular matrix components are present in these tissues?
- How are the cells and matrix arranged?
- How do those components affect how the tissues look and feel?
- How does their arrangement affect how they look and feel?

Chicken Part*	Cells/matrix present, link to how the tissues look and feel
---------------	---

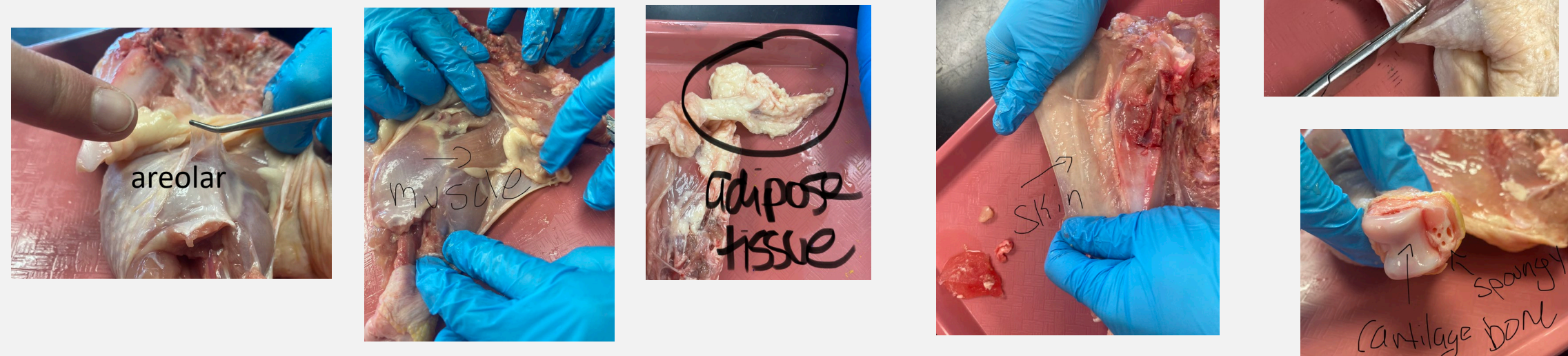
Things to think about:

- Do the functions of the tissue “match” their textures and appearance?
- Can you relate their gross appearance or texture to their function?

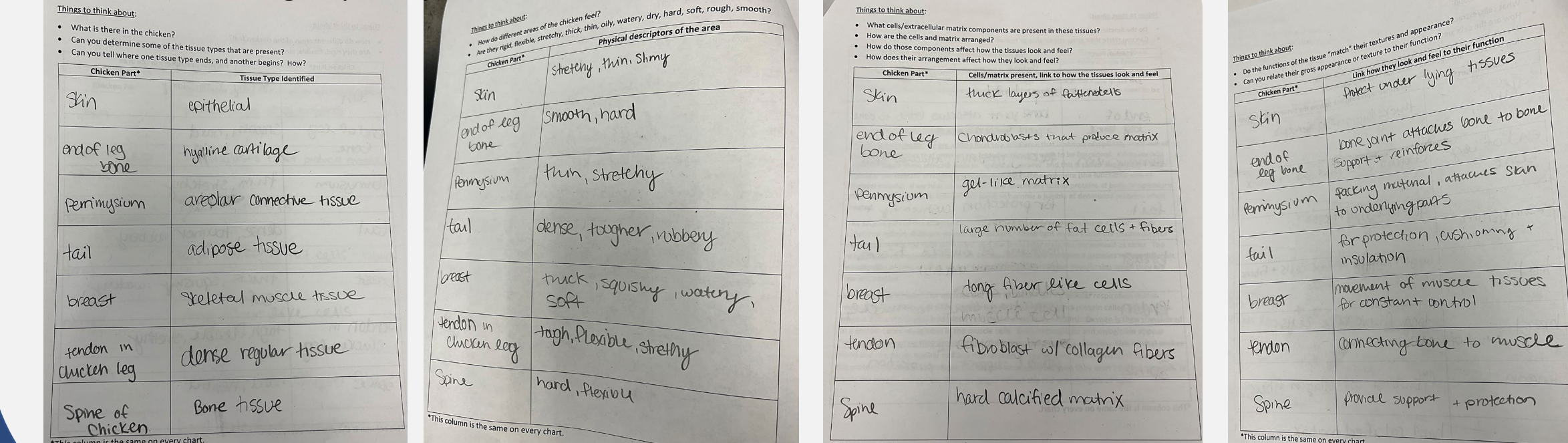
Chicken Part*	Link how they look and feel to their function
---------------	---

Student Work Examples:

➤ Photos captured and labeled

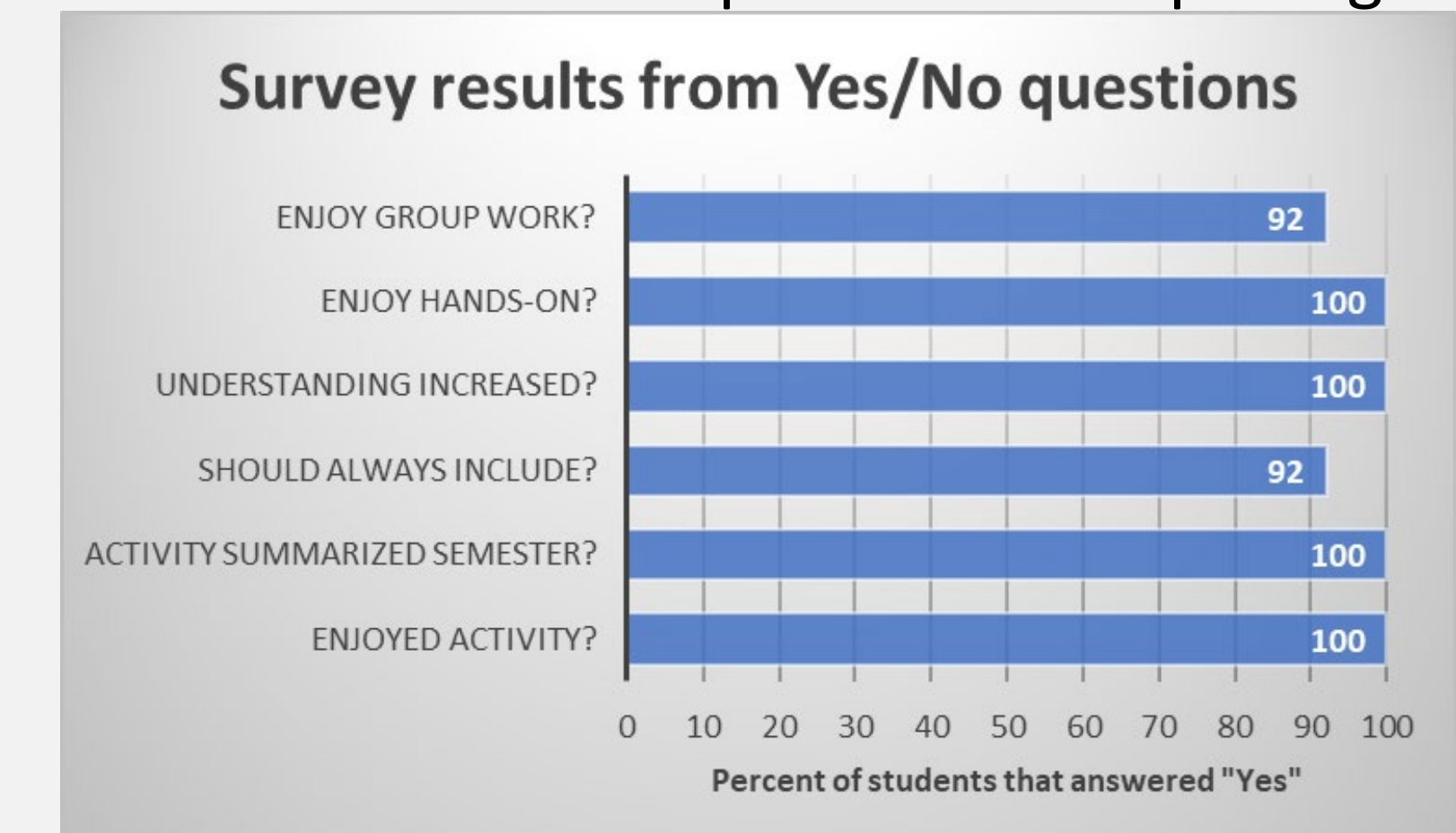


➤ Charts from one group completed



Student Survey Results:

*Students were offered bonus points for completing the survey.



Summary of results from open-answer questions:

- *What did you like about the activity?*
 - Hands on learning and looking for different tissues in a real-life scenario.
- *What did you dislike about the activity?*
 - There was nothing I didn't like about the lab.
- *What do you suggest would improve the activity?*
 - Have each group study a part and then report about that tissue to the other groups.
- *What was your favorite lab this semester?*
 - This lab, the bone tissue lab with human and chicken bones, all the hands-on labs.

*Full list of responses available upon request

Future Ideas:

- Use this lab at the end of the A&P1 semester to summarize the entire semester
- Use the lab at the very beginning of A&P2 semester to refresh students on what was learned in A&P1
- Would like to implement the lab in my online course

Sharing:

- I am happy to share my files!
- potterk@canton.edu

Acknowledgements:

- Jamie Sovie, my instructional support assistant, for going along with my idea to create a new laboratory exercise and making it happen.
- The SUNY Canton College Foundation for funding my registration and travel costs.