# Learning Bovine Reproductive Anatomy Using a Bovine Palpation and Cervix Simulator

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## Abstract

The Physiology of Reproduction course at Abraham Baldwin Agricultural College discusses the principles of reproduction in farm animals and includes the use of abattoir specimens and diagrams to learn key reproductive structures in the female bovine. Simulation models can be an effective tool at providing experiential learning opportunities. The purpose of this study was to integrate a bovine palpation and cervix simulator into the current course curriculum. The female bovine reproductive anatomy curriculum occurred during a three-week period in spring 2020. Data was collected from students enrolled in the Physiology of Reproduction course and effectiveness of integrating the simulator was assessed using an optional survey at the end of the female bovine reproductive anatomy curriculum. Survey questions were formatted on a five-point Likert scale (1 = strongly agree, 5 = strongly disagree). Of the 23 students that elected to participate in the survey, 78.3% strongly agreed or agreed that the simulator helped them locate key reproductive structures and the cervix simulator clarified the differences in bovine cervical anatomy. Approximately, 82.6% strongly agreed or agreed that the simulator helped them better understand bovine reproductive anatomy and increased their interest in learning more about bovine reproduction. Overall, 87.3% of students strongly agreed or agreed that the simulators were useful learning tools and 91.3% of students indicated that they were better able to visualize bovine reproductive anatomy in 3D. In summary, the bovine palpation and cervix simulator is an effective teaching aid and increases student interest in the subject matter.

## Introduction

- Experiential learning is a known method for providing students with learning opportunities where they can form genuine interests and enthusiasm for their field of study.
- Considering both the economic concerns of animal use and animal welfare management, simulation models can be an effective tool at providing experiential learning opportunities in undergraduate educational programs (1).
- Bovine reproductive anatomy simulators have been shown to improve learning outcomes in undergraduates (2).
- The Bovine Breeder™ and cervix kit is a life-size artificial insemination and pregnancy palpation simulator (figure 1).
- Using this simulator, students learn correct cervix manipulation, artificial insemination techniques, pregnancy palpation, and reproductive system landmarks.

## Objectives

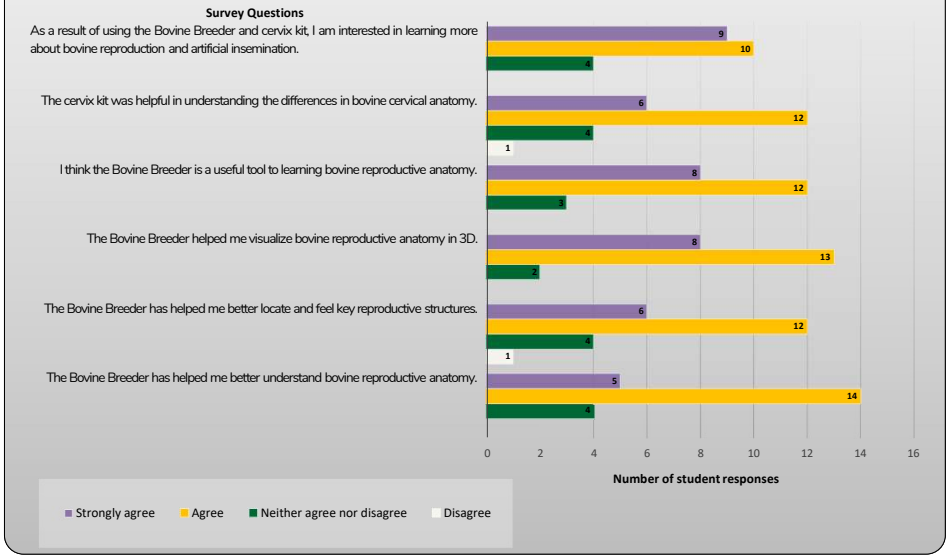
- The purpose of this project is to integrate the Bovine Breeder™ and cervix kit simulator into an undergraduate physiology of reproduction course at ABAC.
- Assess the simulator curriculum through a student survey.
- The goal is to provide experiential learning opportunities so that students can develop an interest in the field of bovine reproduction and continue their education to benefit the cattle industry.

**Fig. 1.** Image of the Bovine Breeder™ simulator and cervix kit

## Methods

- The female bovine reproductive anatomy curriculum occurred during a three-week period in spring 2020 with 25 students enrolled in the Physiology of Reproduction course at ABAC.
  - Traditional lectures covering bovine reproductive anatomy were presented during the first 2 weeks.
  - A wet lab using bovine reproductive tracts collected from a local slaughter facility allowed students to visualize key reproductive structures.
- During the third week, proper technique for palpation and passing an insemination rod through a cervix was demonstrated using the Bovine Breeder™ and cervix kit.
  - Students were then divided into groups of 5 and allowed to practice passing an insemination rod through 9 cervixes that range in size to simulate young through older bovine.
  - Each group also practiced finding key reproductive structures using the Bovine Breeder™ simulator.
- A total of 3.5 hours of the curriculum was dedicated to allowing students access to the Bovine Breeder™ and cervix kit.

## Student Feedback




## Results

- Student feedback was assessed using an optional survey at the end of the female bovine reproductive anatomy curriculum. Survey questions were formatted on a five-point Likert scale (1 = strongly agree, 5 = strongly disagree).
- Of the 23 students that elected to participate in the survey, 78.3% strongly agreed or agreed that the simulator helped them locate key reproductive structures and the cervix simulator clarified the differences in bovine cervical anatomy.
- Approximately, 82.6% strongly agreed or agreed that the simulator helped them better understand bovine reproductive anatomy and increased their interest in learning more about bovine reproduction.
- Overall, 87.3% of students strongly agreed or agreed that the simulators were useful learning tools and 91.3% of students indicated that they were better able to visualize bovine reproductive anatomy in 3D.

## Discussion

- Overall student feedback was positive.
- The bovine palpation and cervix simulator can be an effective teaching aid and increases student interest in the subject matter.
- Future plans are to allow students more time practicing passing an insemination rod through a cervix with the Bovine Breeder ™

## References

1.Medley, C. F. & Horne, C. *J nursing education* **44**, 31–4 (2005).
2.Baillie, S.,et al. *J Vet Med Ed* **32**, 79–85 (2005).

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