

**Program Assessment Report
 DBCALFS ANSC BS Program
 University of Arkansas
 May 2016**

1. Student Learning Outcome #1

Students will demonstrate an understanding of scientific knowledge and gain a basic foundation in the general animal sciences, including physiology, genetics, nutrition, muscle foods, as well as demonstrate production management skills

A. Assessment Measure 1 – Direct

- A pre- and post-assessment was conducted for incoming freshman and graduating seniors.
- A 70 question assessment tool was developed by the student assessment committee from questions that were created by the ANSC faculty. The test was administered to incoming freshmen in the ANSC 1032 course and to outgoing seniors by appointment.
- The 2016 scores and change in percentage correct between the pre and post assessments are reported below.

Freshman, % correct (n = 39)	Senior, % correct (n = 25)	Percentage Unit Change in % correct	Improvement
46.2 0 students had >70% correct	70.98 18 students (72%) had >70% correct	+24.8%	54%

- An improvement of 54% between freshman and senior scores was achieved. However, it should be noted that these are not the same students, i.e. not a longitudinal study at this point, those data will be collated in the future.
- The target for the student pre, post assessment, as determined by the departmental committee was there would be 70% of graduating seniors that scored 'average' or above. If average is set at 70% then 72% of the Seniors that took the assessment met this goal. Thus this reaches the acceptable level as determined by the department.
- However, during the last review of the assessment plan, the consultant suggested that acceptable be a 70% improvement in scores between the pre and post assessment, and an ideal outcome would be a 90% improvement in scores. Our results for 2016 are an improvement of 54% in the scores – this does not reach that acceptable level. However, in order to achieve a 70% improvement in scores, seniors would have to average 78.5% on the exam. This seems impractical since some of the seniors taking the exam may have not had basic courses for two or more years and some of the seniors transferred from other institutions with credit for basic courses.
- **In summary:**
 - The initial year of data collection was 'rocky'. We have learned that the designated faculty compiling this report will have to take care of details earlier in the process of administering and scoring the assessment exam, and that faculty members teaching

senior-level production courses will have to be more proactive in conducting desired assessments.

- No Freshmen scored greater than 70% correct (range of 33 to 69% correct); however, 72% of the Seniors scored greater than 70% correct (range of 53 to 83% correct). It would appear that the department is improving the understanding of scientific knowledge in the Animal Sciences.
- There were 8 questions on the assessment instrument that were correctly answered by <50% of the Seniors. These questions were distributed throughout the disciplines (3 physiology, 1 genetics, 2 nutrition, 1 muscle foods, 1 management); they were not concentrated within any single discipline.
- **The rigor of the assessment and the appropriate metric for 'acceptable' requires continued discussion within the department.**

B. Assessment Measure 2 - Indirect

- A self-assessment student survey was administered to graduating seniors to determine understanding and knowledge related to the animal sciences.
- A 26 question survey was developed by the student assessment committee. This survey was administered to outgoing seniors by appointment concurrently with the assessment above.
- Results: 30 surveys were distributed and 23 were returned, a 76.6% response rate. Results are as follows:

Do you have a pre-professional/pre-vet concentration? **9 Yes**

Do you have an equine concentration/minor? **6 Yes**

On a scale of 1 – 5, please rate your general competence in the areas listed below.

1 = I don't feel competent in this area; 5 = I feel I have a general competence in this area

	Area of Competence	Score (1-5)
1	Physiology	3.75
2	Genetics	3.15
3	Nutrition	3.85
4	Meat Production	2.50
5	Animal production management & animal welfare and sustainability practices	4.50
6	Animal handling, restraint and general animal care skills	4.55
7	Technical competency	3.65
8	Environmental consciousness	4.25
9	Ethical responsibility	4.70
10	Leadership ability	4.45
11	Oral communication	4.45
12	Written communication	4.55
13	Critical thinking/problem solving skills	4.40
14	Basic and applied research skills	4.20
15	Creativeness	4.40
16	Writing and presenting scientific information in a professional manner	4.05

For Equine concentration/minor ONLY:

17	Equine reproduction management	4.00
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18	Fundamentals of equine care	4.83
19	Equine evaluation	4.33
20	Equine marketing	3.83

For Pre-professional, Pre-vet ONLY:

21	General knowledge of advanced disciplines of basic sciences and mathematics	4.40
22	Fundamentals of animal health	4.60

Have you applied to vet or grad school? **8 Yes**

Have you been accepted to vet or grad school? **7 Yes**

If not attending grad/vet school, do you have an offer of employment? **5 Yes**

Vet School/ Grad School	Employment
Oregon State vet School	Tyson Food, Inc.
UAMS	AR Teacher Corp.
UA Grad School	Animal Medical clinic
OSU	Oklahoma Medical Research Foundation
Arkansas State University	Little Rock Zoo
University of Missouri	

- **In summary:**
 - The average score for the 16 areas of competence was 4.09 on the 1 = 'I don't feel competent in this area to 5 = 'I feel I have a general competence in this area' scale. The lowest ranked area of competence was for meat production (score of 2.5) followed by genetics (score of 3.15). These 2 areas were outliers from all the other areas of competence (remainder had scores of ≥ 3.65). We are satisfied at the onset of this process that the Department of Animal Science is instilling confidence in the graduating seniors in their abilities in a number of areas that are important to their future success.

2. Student Learning Outcome #2:

Students will possess problem solving skills.

A. Assessment Measure 3 – Direct

- Rubric for problem solving skills (a scale of 1 to 4, with 1 = Benchmark and 4 = Capstone) was developed and distributed to appropriate course instructors. This Problem Solving rubric is within both the Written and Oral Presentation rubrics (attached to report).
- Rubric was used to assess outgoing seniors in the ANSC production courses. Because rubrics were not developed before the fall semester these were only able to be used in the spring semester courses (ANSC 4283 Horse Production, ANSC 4452 Milk Production, ANSC 4652 Stocker-Feedlot Cattle Management)
- Results: Scores for this rubric were returned by 2 faculty.
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Course	Number of Seniors	Mean Score	% students receiving a score of:			
			4	3	2	1
ANSC 4283	4	3.25	75%	0%	0%	25%
ANSC 4652	2 (each assessed twice)	3.5	50%	50%	0%	0%
Total	6	3.33	67%	17%	0%	17%

- **In summary:**

- **The target for the Department was that 70% of graduating seniors would score an 'average' or above. Although it was noted by the consultant that the department needs to use consistent terminology and clearly state what score is average; it appears that <70% of the students have a score ≤ 3 and thus the department met this goal.**

3. Student Learning Outcome #3:

Students will possess critical thinking skills and objectively make decisions about contemporary issues based upon scientific facts rather than emotion.

B. Assessment Measure 4 – Direct

- A rubric for critical thinking skills (a scale of 1 to 4, with 1 = Benchmark and 4 = Capstone) was developed and distributed to appropriate course instructors. This critical thinking rubric is within both of the Written and Oral Presentation rubrics (attached to report).
- Rubric was used to assess outgoing seniors in the ANSC production courses. Because rubrics were not developed before the fall semester these were only used in the spring semester courses (ANSC 4283 Horse Production, ANSC 4452 Milk Production, ANSC 4652 Stocker-Feedlot Cattle Management)
- Results: Scores for this rubric were returned by 1 faculty

Course	Number of Seniors	Mean Score	% students receiving a score of:			
			4	3 to 4	2 to 3	1 to 2
ANSC 4652	2 (each assessed twice)	3.25	50%	0%	50%	0%

- **In summary:**

- **The target for the Department was that 70% of graduating seniors would score an 'average' or above. Only 50% of the students assessed with the rubric scored ≤ 3 , thus the department did not meet this goal. However, only 2 students were assessed with during the one semester that the rubric has been used.**

4. Student Learning Outcome #4.

Students will demonstrate basic oral (Outcome 4a) and written (Outcome 4b) communication skills and demonstrate the ability to write and present information in a professional manner.

A. Assessment Measure 5 - Direct

- A rubric has been created to assess oral communication skills. It contains 6 performance areas with a 1 to 4 scale within each of those areas (attached to report).

- The rubric was used to assess outgoing seniors in the ANSC production courses. Because rubrics were not developed before the fall semester these were only used in the spring semester courses (ANSC 4283 Horse Production, ANSC 4452 Milk Production, ANSC 4652 Stocker-Feedlot Cattle Management)
- Results: Scores for this rubric were returned by 1 faculty

Course	Number of Seniors	Mean Score	% students receiving a score of:			
			4	3 to 4	2 to 3	1 to 2
ANSC 4652	2	3.125	50%	0%	50%	0%

- **In summary:**
 - **The target for the Department was that 70% of graduating seniors would score an 'average' or above. Only 50% of the students assessed with the rubric scored ≤ 3 , thus the department did not meet this goal. However, only 2 students were assessed with during the one semester that the rubric has been used.**

B. Assessment Measure 6 – Direct

- A rubric has been created to assess written communication skills. It contains 6 performance areas with a 1 to 4 scale within each of those areas (attached to report).
- The rubric was utilized to assess outgoing seniors in the ANSC production courses. Because rubrics were not developed before the fall semester these were only used in the spring semester courses (ANSC 4283 Horse Production, ANSC 4452 Milk Production, ANSC 4652 Stocker-Feedlot Cattle Management)
- Results:

Course	Number of Seniors	Mean Score	% students receiving a mean score of:			
			4	3 to 4	2 to 3	1 to 2
ANSC 4283	4	3.45	25%	50%	25%	0%
ANSC 4652	2	2.8	0%	50%	0%	50%
Total	6	3.23	17%	50%	17%	17%

- **In summary:**
 - **The target for the Department was that 70% of graduating seniors would score an 'average' or above. Although it was noted by the consultant that the department needs to use consistent terminology and clearly state what score is average; it appears that 67% of the students have a score ≤ 3 and thus the department did not meet this goal.**

5. Overall Recommendations

The Animal Science Department needs to clarify the targets for acceptable and ideal performance based on the rubrics that have been developed.

There was growth in scientific knowledge from Freshman to Seniors, and where there were errors on the exam by the seniors they were distributed across disciplines, not concentrated within any one discipline.

There were greater than 70% of the Seniors that were rated acceptable in problem solving; however, less than 70% of the seniors assessed in critical thinking, and communication (both oral and written) skills reached the desired goal. Thus far only 6 students were assessed

12/19/2016

with the new rubrics. While all senior level Animal Science production courses probably have projects or assignments where some or all of these rubrics could be used, the rubrics were not available early enough in the planning process to have them all incorporated into all courses this past spring. Eventually, there are 7 courses where they could be used in an effort to sample all the senior ANSC students (ANSC 4283 Horse Production - Spring, ANSC 4452 Milk Production - Spring, ANSC 4652 Stocker-Feedlot Cattle Management – Spring, ANSC 4252 – Cow-Calf Management – Fall, ANSC 4262 Swine Production – Fall of even years, ANSC 4272 Sheep Production – Spring of odd years, ANSC 4482 Companion Animal Management – Fall).

6. Action Plan

- a. The Animal Science Department needs to spend time in August 2016 during the faculty retreat clarifying the acceptable and ideal targets for these assessments.**
- b. During the faculty retreat we must also discuss the possibility of a single senior capstone course that would enhance our ability to collect the necessary data for the assessment report.**
 - i. If this is not the will of the department then faculty teaching the ANSC production courses need to attempt to incorporate all rubrics into their syllabi and courses.**
 - ii. If multiple faculty are using rubrics, inter-rater reliability must be addressed.**
- c. Faculty members who teach senior-level production courses need to and will be proactive during the administration of the assessments and attempt to improve the quality and quantity of the data available for the annual report.**

2016 Survey of ANSC Graduates

Major(s): _____

Student ID: _____

Minor(s): _____

Do you have a pre-professional/pre-vet concentration? Yes No

Do you have an equine concentration/minor? Yes No

On a scale of 1 – 5, please rate your general competence in the areas listed below.

1 = I don't feel competent in this area; 5 = I feel I have a general competence in this area

	Area of Competence	Score (1-5)
1	Physiology	
2	Genetics	
3	Nutrition	
4	Meat Production	
5	Animal production management & animal welfare and sustainability practices	
6	Animal handling, restraint and general animal care skills	
7	Technical competency	
8	Environmental consciousness	
9	Ethical responsibility	
10	Leadership ability	
11	Oral communication	
12	Written communication	
13	Critical thinking/problem solving skills	
14	Basic and applied research skills	
15	Creativeness	
16	Writing and presenting scientific information in a professional manner	

For Equine concentration/minor ONLY:

17	Equine reproduction management	
18	Fundamentals of equine care	
19	Equine evaluation	
20	Equine marketing	

For Pre-professional, Pre-vet ONLY:

21	General knowledge of advanced disciplines of basic sciences and mathematics	
22	Fundamentals of animal health	

Have you applied to vet or grad school? Yes No

Have you been accepted to vet or grad school? Yes No If yes, where? _____

If not attending grad/vet school, do you have an offer of employment? Yes No

If you have an offer of employment, where? _____

Please list one or two content areas that you feel the ANSC Dept. should improve:

Please list one or two strengths of the overall ANSC Dept.:

This survey will be used for departmental assessment purposes. Honestly completing this survey will help professors in the Department of Animal Science better serve students toward the goal of obtaining a quality degree.

Name _____ ID # _____

1. Class Status:
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Continuing Ed. student
2. ANSC Degree Plan
 - a. General ANSC
 - b. Pre-Professional
 - c. Equine
 - d. Other, not ANSC
3. Citizenship:
 - a. U.S.
 - b. Other
4. Gender:
 - a. ___ Male
 - b. ___ Female
 - c. ___ Transgender
 - d. ___ Prefer not to respond
5. Race/Ethnicity:
 - a. ___ African American
 - b. ___ Asian/ Pacific Islander
 - c. ___ Other
 - d. ___ Hispanic/Latino
 - e. ___ Caucasian
6. Age:
 - a. ___ Under 18
 - b. ___ 18-19
 - c. ___ 20-21
 - d. ___ 22-24
 - e. ___ 25 and above
7. Are you considered in-state or out-of-state for tuition purposes?
 - a. ___ In state
 - b. ___ Out of state
8. How many hours do you work for pay?
 - a. ___ None
 - b. ___ 1-10 hrs. /week
 - c. ___ 11-20 hrs. /week
 - d. ___ 21-30 hrs. /week
 - e. ___ More than 30 hrs. /week

9. Please check the organizations that you have been associated with:

- a. FFA
- b. 4H
- c. Judging team
- d. All of the above
- e. None of the above

10. Transfer student?

- a. No
- b. Yes, transferred from 2 year college
- c. Yes, transferred from other University or 4 year college

11. What type of background do you come from?

- a. Rural
 - b. Urban
-

12. Milk fever...

- a. is most common in animals consuming lush spring pasture
- b. can be caused by feeding a diet deficient in Ca prior to calving
- c. results in muscle spasms and paralysis due to low blood K
- d. could be treated by infusing Ca and/or PTH into the blood of the cow

13. Which of the following hormones may be given to sows to stimulate uterine contractions?

- a. Oxytocin
- b. Oxycontin
- c. Estrogen
- d. Swine growth hormone

14. What is the most reliable sign of estrus?

- a. Holds tail out
- b. Lordosis or standing heat
- c. Rides other animals
- d. Excessive grunting

15. This protein hormone is produced and released by the anterior pituitary and stimulates the formation and retention of the corpus luteum. It also initiates ovulation.

- a. Progesterone
- b. Estrogen
- c. Luteinizing hormone
- d. Insulin.

16. What hormone is important in seasonal breeders, is inhibited by light, and the major source is the pineal gland?

- a. Melatonin
- b. Estrogen
- c. Oxytocin
- d. Progesterone

17. Where does spermatogenesis occur?
- Seminal vesicles
 - Seminiferous tubules
 - Prostate
 - Epydidymus
18. Hormone produced and released by the hypothalamus that causes release of follicle stimulating hormone and luteinizing hormone is:
- Progesterone
 - Prostaglandin F2alpha
 - Gonadotropin releasing hormone
 - Estrogen
19. The type of placenta attachment common to ruminant animals is:
- Diffuse
 - Discoid
 - cotyledonary
 - zonary
20. Hormone produced by the corpus luteum and/or placenta that maintains pregnancy is:
- placental lactogen
 - prolactin
 - relaxin
 - progesterone
21. Phase of the estrous cycle when progesterone is the dominant hormone:
- estrus
 - diestrus
 - proestrus
 - metestrus
22. Farm animal that has a specific site (ovulation fossa) on their ovary where ovulation occurs:
- sow
 - mare
 - cow
 - ewe
23. During the early stages of a fast, it is critical that glycogen from liver and muscle, and amino acids from body tissues supply the precursors for the critical nutrient _____. Without this nutrient, the animal loses consciousness.
- Fatty acids
 - urea
 - phosphorus
 - glucose

24. Endocrinology is one of two internal communication systems within vertebrates. Ligands synthesized and released by the anterior pituitary directly control many physiological systems. Which of the following systems is not directly affected by the anterior pituitary?
- Growth
 - Lactation
 - Stress
 - Sense of smell
25. Which breed of dairy goat has very small almost-nonexistent ears??
- Dorper
 - Boer
 - La Mancha
 - Oberhasli
26. From the mating of two homozygous polled parents, what percentage of the offspring would you expect to have a homozygous polled genotype? (You may assume that polled is dominant)
- 0%
 - 25%
 - 50%
 - 75%
 - 100%
27. If a heterozygous black bull is mated to 100 red cows, approximately how many of the resulting calves will be red?
- 0
 - 25
 - 50
 - 75
 - 100
28. When a Charolais bull is mated to a black Angus cow, a gray calf results. That is an example of _____.
- Shared dominance
 - Incomplete dominance.
 - Complete dominance
 - Over dominance.
29. What is the term for those traits in which there is no sharp distinction between phenotypes, with a gradual variation from one phenotype to another? Usually gene pairs and environmental influences are involved.
- Qualitative traits
 - Quantitative traits
 - Dominant traits
 - Non-dominant traits

30. What term describes the appearance and performance characteristics of an animal?
- Heterozygote
 - Mitosis
 - Genotype
 - Phenotype
31. What is the general model describing phenotypic variation?
- Phenotype = Genotype + Environment
 - Phenotype = Genetics + Diet
 - Phenotype = Breed Average + yearly adjustment factor
 - None of the above
32. What is a SNP?
- A location in the genome where a single nucleotide variation exists used for genetic associations used in breeding.
 - A short nuclear proliferation effect
 - A genetic phenomenon that always causes variation in traits
 - A small nucleotide parameter
33. What is a valid description of an epigenetic effect?
- An effect that appears to be genetic but is not
 - An effect that is partially impacted by the environment
 - An effect on DNA methylation in the parents that impacts the phenotype of the offspring
 - Both B and C
34. Which of the following terms can be defined as: the expression of genes at one locus depends on alleles present at one or more other loci.
- Incomplete dominance
 - Single genetic decision
 - Single trait selection
 - Epistasis
35. The proportion of phenotypic variation that can be passed from parent to offspring is referred to as:
- Selection differential
 - Selective breeding
 - Genotype
 - Heritability
36. Which of the following is the fourth stomach compartment in ruminants, known as the true stomach?
- Rumen
 - Reticulum
 - Oakum
 - Abomasum

37. What is the term for a high-acid condition in the rumen (pH 5.3-5.7) caused by rapid consumption or overconsumption of readily fermentable feed; may cause digestive disturbance and/or death?
- Colic
 - Acidosis
 - Black leg
 - Bloat
38. What mineral and vitamin are deficient in neonates suffering from White Muscle Disease?
- Iron and vitamin B
 - Selenium and vitamin C
 - Iron and vitamin A
 - Selenium and vitamin E
39. In a typical corn-soybean meal based diet for a monogastric, which amino acid is most limiting?
- Methionine
 - Tryptophan
 - Lysine
 - Tyrosine
40. Which sulfur containing amino acid is most likely to be deficient in swine?
- Tryptophan
 - Glycine
 - Leucine
 - Methionine
41. What are the two main gases produced in the rumen?
- Methane and oxygen
 - Methane and carbon dioxide
 - Oxygen and helium
 - Oxygen and carbon monoxide
42. Ruminant's ability to break down _____ allows them to utilize forage more efficiently than monogastrics.
- Saturated fats
 - Cellulose
 - Lignin
 - Simple carbohydrates
43. Volatile Fatty Acids (VFA's) are an important source of _____ for ruminants?
- Energy
 - Protein
 - Fat
 - Fiber
44. The fermentative organ of hindgut fermenters, comparable in function to the rumen, is the:
- Colon
 - Cecum
 - Rectum
 - Small Intestine

45. Which of the following is a fat-soluble vitamin?
- Vitamin K
 - Pantothenic acid
 - Vitamin B12 (cobalamin)
 - Vitamin C
46. Which of the following is NOT an essential amino acid?
- Isoleucine
 - Histidine
 - Riboflavin
 - Threonine
47. What is the most abundant nutrient in the body?
- Minerals
 - Water
 - Protein
 - Carbohydrates
48. Which of the following agency is responsible for meat grading?
- The Food Safety Inspection Service (FSIS) within USDA
 - The Agricultural Marketing Service (AMS) within FDA
 - The Agricultural Marketing Service (AMS) within USDA
 - The United States Meat Export Federation (USMEF)
 - Meat grading is not regulated by a governmental agency.
49. What is the average dressing percentage for a beef animal?
- 52%
 - 62%
 - 72%
 - 82%.
50. What is name of the pigment responsible for fresh meat color?
- Myoglobin
 - Myosin
 - Myostatin
 - Marbling
51. To what minimum temperature should ground beef be cooked to ensure safety?
- 100 C
 - 120 F
 - 145 F
 - 160 F
 - 185 F

52. _____ The point at which Fat begins to increase in proportion and muscle begins to decrease in proportion of carcass wt.
- onset of fattening
 - Point of inflection
 - Birth
 - Puberty
53. _____ This type of fat develops within the muscle and is referred to as Marbling.
- Subcutaneous
 - Intramuscular
 - Visceral
 - Intermuscular
54. Proper refrigeration of foods is important because:
- Most harmful bacteria are killed at temperatures below 40 degrees F.
 - Most harmful bacteria do not grow at temperatures below 40 degrees F.
 - It prevents cross-contamination of food
 - Refrigeration is not important
55. Which of the following is true about Organic Beef producers?
- Cattle may have been given antibiotics if they were sick and their welfare was compromised
 - Forage from pastures that have not had pesticides for 1 year is allowed for cattle marketed as organic
 - The USDA states that this beef is safer and more nutritious
56. During skeletal muscle contraction, what ligand initiates skeletal muscle contraction and how is calcium directly involved with skeletal muscle contractions?
- Acetylcholine stimulates muscle fibers, and calcium binds to calmodulin
 - Acetylcholine stimulates muscle fibers, and calcium binds to troponin
 - Oxytocin stimulates muscle fibers, and calcium binds to calmodulin
 - Oxytocin stimulates muscle fibers, and calcium binds to troponin
57. Lactating animals work very hard to provide a nutritious product. Milk ejection is caused by contraction of the smooth muscle myoepithelial cells. What ligand initiates myoepithelial cell contraction and how is calcium directly involved with smooth muscle contractions?
- Acetylcholine stimulates muscle fibers, and calcium binds to calmodulin
 - Acetylcholine stimulates muscle fibers, and calcium binds to troponin
 - Oxytocin stimulates muscle fibers, and calcium binds to calmodulin
 - Oxytocin stimulates muscle fibers, and calcium binds to troponin
 - The USDA has a set of national standards regulating using the organic label
58. In order to achieve optimal passive transfer of antibodies from the dam to neonate, colostrum must be ingested by the neonate by _____ after birth.
- 24 hours
 - 48 hours
 - 3 days
 - None of the above

59. In order to be compliant with Beef Quality Assurance standards, vaccines should only be given in the _____ area of cattle.
- rump
 - flank
 - neck
 - none of the above
60. How much do beef calves typically weigh (live weight) at birth?
- 20 - 30 lbs
 - 30 - 40 lbs
 - 60 - 90 lbs
 - 120 - 140 lbs
61. Which body condition score would be expected to be the "fattest?"
- 3
 - 4
 - 5
 - 6
62. Which disease is detected using the Coggins test?
- Encephalitis
 - Equine infectious anemia
 - Equine protozoal myelitis
 - Tetanus
63. How many days is the average gestation length in sheep?
- 114 days
 - 148 days
 - 3 months, 3 weeks, 3 days
 - 204 days
64. What is the standard bull to cow ratio for a mature breeding bull?
- 1:10 to 1:12
 - 1:24 to 1:30
 - 1:60 to 1:75
 - 1:100 to 1:120
65. Sometimes tall fescue can cause problems for pregnant broodmares. What specifically can cause fescue to be a problem?
- A chemical produced by the plant
 - A chemical produced by an endophytic fungus living in the plant
 - An allergic reaction by the broodmare from touching the plant
 - An insect living on the leaves of the plant

66. We test the specific gravity of a dam's colostrum in order to estimate the _____ content.

- a. Calcium
- b. Vitamin
- c. Immunoglobulin
- d. Nutrition
- e. Antioxidant

67. Which of the following best describes stage 2 parturition in the dam?

- a. The muscles of the croup and vulva relax, the udder begins to wax, and milk physiology changes.
- b. The mare appears uneasy, is very sweaty, and paces often. She may appear mildly colicky.
- c. The rupture of the placental membranes and the expulsion of the fetus
- d. Expulsion of the placenta

68. Proper refrigeration of foods is important because:

- a. Most harmful bacteria are killed at temperatures below 40 degrees F.
- b. Most harmful bacteria do not grow at temperatures below 40 degrees F.
- c. It prevents cross-contamination of food
- d. Refrigeration is not important

69. The point at which pressure in the flight zone results in forward vs. backward movement is the:

- a. Flight Zone
- b. Point of Balance
- c. Blind Spot
- d. Squeeze Chute

70. Ideally, a beef cow should calve every:

- a. 6 months
- b. nine months
- c. year
- d. two years