

TEXAS A&M UNIVERSITY (TAMU) ANSC 305 ANIMAL BREEDING EXAM 1 PRACTICE (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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- 1. Which pair of environments is noted as an example of GEI in cattle?**
 - A. Florida and Montana Cattle GEI
 - B. Texas and California Cattle GEI
 - C. Alaska and Hawaii Cattle GEI
 - D. New York and Florida Cattle GEI
- 2. Genetic components include additive, dominance, and what other interaction?**
 - A. Hybrid vigor
 - B. Epistatic
 - C. Non-additive genetics
 - D. Environmental effects
- 3. What is the Percheron's primary use?**
 - A. Farm work
 - B. Racing
 - C. Show jumping
 - D. Endurance
- 4. What is the correct sequence constituting the Central Dogma of Biology?**
 - A. DNA-Transcription-RNA-Translation-Protein
 - B. DNA-Replication-RNA-Translation-Protein
 - C. RNA-Transcription-DNA-Translation-Protein
 - D. RNA-Transcription-RNA-Translation-Protein
- 5. Cattle reference genome name?**
 - A. Sscrofa11.1/susScr11
 - B. ARS-UCD1.2/bosTau9
 - C. EquDab3.0/equCab3
 - D. Oar_v4.0/oviAri4

- 6. Which statement best describes the long-term breeding strategy?**
- A. Improvement through random selection
 - B. Match animal genetic resources to production environment for better output and/or reduced input costs
 - C. Ignore environment variations
 - D. Focus on a single trait
- 7. Which breed from Australia is Prolific, known for multiple births and good wool quality?**
- A. Angora
 - B. Dorset
 - C. Booroola Merino
 - D. Finnsheep
- 8. Which population phenomenon explains how two isolated groups can become genetically distinct after a founder event?**
- A. Migration between populations reduces genetic differences
 - B. Founder effect due to a closed population leads to genetic divergence
 - C. Random mating across large populations
 - D. Natural selection alone without drift
- 9. Which statement best describes the purpose of pedigree analysis?**
- A. Used to determine the nature of inheritance for genetic diseases
 - B. Used to estimate population allele frequencies
 - C. Used to map genes to specific chromosomes
 - D. Used to predict environmental effects on phenotypes
- 10. What is considered a classic demonstration of genotype-environment interaction (GEI) in cattle?**
- A. Hereford cattle in 20th century
 - B. Holstein cattle in 20th century
 - C. Angus cattle in 21st century
 - D. Merino sheep in 19th century

Answers

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1. A
2. B
3. A
4. A
5. B
6. B
7. C
8. B
9. A
10. A

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Explanations

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1. Which pair of environments is noted as an example of GEI in cattle?

- A. Florida and Montana Cattle GEI
- B. Texas and California Cattle GEI
- C. Alaska and Hawaii Cattle GEI
- D. New York and Florida Cattle GEI

Genotype by environment interaction happens when different genetic makeups perform differently depending on the environment. In cattle, Florida and Montana create one of the clearest demonstrations because they sit at opposite ends of the climate spectrum: Florida's hot, humid conditions with year-round forage and parasite challenges contrast strongly with Montana's cooler, harsher winters and different pasture quality. Under such contrasting environments, the genetic traits that help an animal excel in Florida (like heat tolerance or efficiency on warm-season forages) aren't necessarily the same traits that steer top performance in Montana. So the animals that rank highest in Florida won't automatically rank highest in Montana, illustrating GEI in action. That's why Florida and Montana are noted as an example: the environmental contrast is large enough to cause different genotypes to perform best in each setting, highlighting why breeders test across environments and consider environment-specific or GEI-aware selection. Other pairs don't show as stark or well-documented a demonstration of GEI in cattle, which is why they aren't used as the standard example.

2. Genetic components include additive, dominance, and what other interaction?

- A. Hybrid vigor
- B. Epistatic
- C. Non-additive genetics
- D. Environmental effects

Genetic components of variation include additive effects, dominance effects, and interactions between genes at different loci, called epistasis. Additive effects are the sum of allele contributions, dominance reflects interactions between alleles at the same locus, and epistasis occurs when the effect of one gene depends on the genotype at another gene, creating non-additive genetic variance that shapes trait expression. Environmental effects are separate from these genetic components, and while hybrid vigor can arise from non-additive effects, the specific interaction described here is epistasis.

3. What is the Percheron's primary use?

- A. Farm work
- B. Racing
- C. Show jumping
- D. Endurance

The Percheron is a large, powerful draft horse bred in France, designed for strength and steady work. Its primary use has historically been pulling heavy loads and performing farm tasks such as plowing, hauling, and other demanding labor. This focus on strength and reliability makes it well-suited for farm work, where the goal is to move heavy weights rather than achieve high speed or nimbleness. Racing requires speed, show jumping needs agility and technique for jumping obstacles, and endurance demands long-distance stamina—traits that are not the Percheron's strongest suit given its heavy build and energy profile. So, the Percheron's main role is farm work.

4. What is the correct sequence constituting the Central Dogma of Biology?

- A. DNA-Transcription-RNA-Translation-Protein**
- B. DNA-Replication-RNA-Translation-Protein
- C. RNA-Transcription-DNA-Translation-Protein
- D. RNA-Transcription-RNA-Translation-Protein

The central dogma describes how genetic information flows from DNA to RNA to protein. DNA serves as the template for transcription, producing RNA (typically messenger RNA). This RNA is then read during translation to assemble amino acids into a protein. DNA replication is a separate process involved in copying DNA for cell division, not the information flow to protein. So the sequence is DNA transcription RNA translation protein.

5. Cattle reference genome name?

- A. Sscrofa11.1/susScr11
- B. ARS-UCD1.2/bosTau9**
- C. EquDab3.0/equCab3
- D. Oar_v4.0/oviAri4

The cattle reference genome is ARS-UCD1.2 for Bos taurus. This assembly is the current standard used for mapping reads, calling variants, and annotating genes in cattle, offering improved contiguity and gene models compared with older builds. bosTau9 is an earlier bovine genome version, so while you might see it referenced in older studies, ARS-UCD1.2 is the one you'll see as the main reference today. The other options correspond to genomes of pigs, horses, and sheep, not cattle.

6. Which statement best describes the long-term breeding strategy?

- A. Improvement through random selection
- B. Match animal genetic resources to production environment for better output and/or reduced input costs**
- C. Ignore environment variations
- D. Focus on a single trait

In the long run, breeding is about aligning the animals' genetic potential with the real production environment to maximize performance while keeping costs in check. Different animals perform differently depending on factors like climate, feed availability, disease pressure, and management. That means the best strategy is to choose genetics that thrive in your specific environment, so you get more output per unit of input or you can achieve the same output with less input. This approach reduces wasted gains by chasing traits that don't pay off in your system and it supports sustainable progress across generations. It also acknowledges that no single trait tells the whole story—economic and environmental considerations require a balanced set of traits chosen with how they interact with the environment in mind. Other options miss this integration. Random selection can be effective only with very large populations and luck, but it doesn't account for how genetics perform under your management. Ignoring environmental variation neglects how context changes outcomes. Focusing on a single trait ignores trade-offs and the broader efficiency you gain when genetics are matched to environment and production goals.

7. Which breed from Australia is Prolific, known for multiple births and good wool quality?

- A. Angora
- B. Dorset
- C. Booroola Merino**
- D. Finnsheep

Prolificacy in sheep can be increased by genetics that raise ovulation rate, leading to more lambs per ewe. Booroola Merino is an Australian breed famous for high litter sizes because it carries the Booroola (FecB) gene, which boosts ovulation and birth numbers while still being a Merino with good wool quality. This combination—Australian origin, multiple births, and Merino-type wool—is what makes this breed stand out for prolificacy with quality wool. The other options don't fit that combination: Angora is raised for mohair and not noted for high twinning; Dorset is British and valued more for meat with less emphasis on wool quality; Finnsheep are highly prolific but originate from Finland and don't have Merino wool characteristics.

8. Which population phenomenon explains how two isolated groups can become genetically distinct after a founder event?

- A. Migration between populations reduces genetic differences
- B. Founder effect due to a closed population leads to genetic divergence**
- C. Random mating across large populations
- D. Natural selection alone without drift

A small number of individuals starting a new, isolated population captures only a sample of the original genetic variation, and with no new genes entering from outside, genetic drift acts strongly. Over generations, the allele frequencies in each founder-derived group drift independently, causing the two populations to become genetically distinct despite their common origin. This is the founder effect in action: a closed population amplifies random differences that lead to divergence. Migration between populations would mix genes and reduce differences, random mating in large populations dampens drift and tends to preserve existing variation, and natural selection without drift requires environmental differences to drive changes—none of which explain divergence due to a founder event in isolated groups as clearly as the founder effect does.

9. Which statement best describes the purpose of pedigree analysis?

- A. Used to determine the nature of inheritance for genetic diseases**
- B. Used to estimate population allele frequencies
- C. Used to map genes to specific chromosomes
- D. Used to predict environmental effects on phenotypes

Pedigree analysis aims to reveal how a trait or disease is inherited by tracing its occurrence through family relationships. By comparing who is affected across generations, you can infer whether the trait follows autosomal dominant, autosomal recessive, or X-linked patterns, which helps estimate recurrence risks and identify carriers. This makes it specifically about understanding the mode of inheritance. The other options describe different genetic goals: population allele frequencies require sampling many individuals from a population, gene mapping to chromosomes involves linking traits to specific genetic markers and chromosomes, and predicting environmental effects on phenotypes deals with non-genetic influences.

10. What is considered a classic demonstration of genotype-environment interaction (GEI) in cattle?

- A. Hereford cattle in 20th century**
- B. Holstein cattle in 20th century
- C. Angus cattle in 21st century
- D. Merino sheep in 19th century

Genotype by environment interaction means that how a genotype performs depends on the environment. Hereford cattle in the 20th century are the classic demonstration of this in practice: data collected across different production environments—different farms, feeds, climates, and management—showed that a sire's progeny could rank highly for growth or carcass traits in one environment but not in another. In other words, the best genetics in one setting aren't universally best in all settings, highlighting the need for multi-environment evaluation and potentially environment-specific selection. While GEI can be observed in other breeds and eras, this Hereford example is the standard teaching reference.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://tamu-ansc305exam1.examzify.com>

We wish you the very best on your exam journey. You've got this!

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