Agricultural Genetic Selection Notesheet
C. Kohn, Waterford WI

Name: Hour Date:

Date Assignment is due: Why late? Score: + ✓ -
 Day of Week Date If your project was late, describe why**Directions**: Use the accompanying PowerPoint (available online) to complete this sheet. This sheet will be due upon the completion of the PowerPoint in class. These assignments are graded on a +/✓/- scale.

1. The purpose of a gene is to help a cell by

the in which to the

needed to make .
2. Draw a chromosome, DNA, and a gene 🡺
Use your notes to assist you:
3. Genes are a part of which can be packed into packages called
4. Each chromosome has a of
5. Why do organisms generally have two copies of every gene?
6. To make a protein, DNA must undergo
7. Transcription is when

which makes ( )
8. The leaves the and goes to
9. The mRNA is read by the in groups of called
10. Each codon codes for a specific
11. Amino acids are strung together in a specific order to form a
12. How is the function of a protein determined?
13. How is the shape of the protein determined?
14. What is primarily responsible for the traits seen in an organism?
15. The more the of a plant or animal, the more

the plant or animal is to an
16. For over , humans have selected the plants and animals that

have the , increasing the likelihood that these traits

would be
17. This has resulted in major to species over time as

became more and less valuable genes become
18. What species did cattle today descend from
19. How was the auroch different from today’s cattle? List three differences:
20. Summarize how the auroch was domesticated into the modern cow:
21. Domestication means to
22. This is usually done through , which is the process in which
23. How is this different from natural selection?
24. How does domestication work?
25. Domestication results in species that are

but also are
26. The improvements in the usually results in the
27. How is corn an example of this?
28. Early domestication usually occurred in
29. Prior to 1900, most agricultural breeding was the result of with
30. Over time, widely different kinds of cattle in an area would become

as
31. As a result of

specific breeds of cattle began to that were

to the
32. What is a breed?
33. Summarize the main traits of the Holstein:
34. Summarize the main traits of the Jersey:
35. Summarize the main traits of the Brown Swiss:
36. Summarize the main traits of the Ayrshire and Guernsey:
37. Summarize the main traits of the Milking Shorthorn:
38. As the benefits of selective breeding became better understood,
began to form.
39. What was their purpose?
40. They kept track of the performance of by

their
41. How did this data help farmers?
42. Summarize the four ways in which changes occur to the genetic make-up of a species:

Mutations:

Random Drift:

Selection:

Crossbreeding:
43. What is hybrid vigor?
44. If the offspring of mixed parents have greater productivity, why not always cross different breeds?
45. An agriculturalist cannot control if

but they can
46. This puts added pressure on an agriculturalist to
47. How do continuous traits affect genetic selection?
48. What is a continuous trait?
49. What is a discontinuous trait?
50. Why can’t we predict milk production in a Holstein in the same way we can predict body color?
51. How do histograms help predict the outcome for continuous traits?
52. What is a bell curve?
53. What are outliers?
54. What is heritability?

1. What is the highest heritability value? What is the lowest?
2. Traits with a heritability of 0.1 or less have , meaning
3. What is an example of this? Most of this trait is determined by
4. Traits with a heritability of 0.1-0.3 have , and are
5. What is an example of this? meaning it is mostly affected by
6. Traits with a heritability of 0.3 have , and are
7. What is an example of this? meaning that we cannot improve milk quality
8. If we want to improve a trait, we need to determine whether we can best improve it through
9. If a trait has low heritability, does this mean we can ignore breeding for it every time? Explain:
10. Summarize the four factors that affect how quickly a species can be improved:

Accuracy:

Intensity:

Genetic Variation:

Genetic Interval:
11. What is correlation?
12. Correlation is related to what topic in Mendelian genetics?
13. What is negative correlation?
14. What is an example of negative correlation?
15. Do the Jersey and Holstein breeds reflect this idea? Explain:

*HINT: what is the Holstein known for? What is the Jersey known for?*
16. What is positive correlation?
17. What is an example of positive correlation?
18. What is Galton’s Law?
19. Galton’s Law means that while we are more likely to have

from , the

the parents, the less likely the offspring
20. Will the best cow in the world have a daughter who also becomes the best cow in the world? Explain

why:
21. What is artificial insemination?
22. How is this different from natural insemination?

1. AI enables one bull to

reducing the need for
2. Instead of only having access to , you could improve

your herd’s genetics by
3. What are three ways in which dairy cattle genetics have changed dramatically since 1900?
4. What is a sire summary?
5. This information can provide a farmer or breeder with the they need to select
6. Sire summaries focus primarily on what?

What is this?
7. This information can then be used to determine

1. A PTA Score can be expressed as a
2. An animal that scores +3 for a trait would be the in regards to that trait.
3. An animal that scores -3 for a trait would be the in regards to that trait.
4. An animal that scores 0 for a trait would be in regards to that trait.
5. A bull that scores a +3 on a highly heritable trait could

the average production of a

and that bull’s genetics would be worth
6. How did Dr. Stephen Babcock contribute to creating modern dairy cows?
7. Babcock’s test not only helped prevent

but provided a basis by which to
8. It was also the first

Unit Wrap-up C. Kohn, Agricultural Sciences - Waterford WI

This page is designed to help raise your grade while enabling you to develop skills you will need for after high
school. You will need to complete every question and blank in order to receive full credit for your notes. Note: if you cannot come up with a strategy to remember a difficult concept on your own, see your instructor for help.

1. What is a topic or concept from this unit that you found to be more challenging? Write or describe below:

In the space below, create a mnemonic, rhyme, analogy, or other strategy to help you remember this particular concept:
2. What is a 2nd topic or concept from this unit that you found to be more challenging? Write or describe below:

In the space below, create a mnemonic, rhyme, analogy, or other strategy to help you remember this particular concept:
3. What is a 3rd topic or concept from this unit that you found to be more challenging? Write or describe below:

In the space below, create a mnemonic, rhyme, analogy, or other strategy to help you remember this particular concept:
4. Circle the most appropriate response. You will only be graded on whether or not you completed this section, so be entirely honest with yourself when completing this section.

Circle one: *I used my notes outside of class to prepare for the quiz.* Definitely – Yes – Sort of - No

Circle one: *I took extra notes in the margins for very difficult concepts.* Definitely – Yes – Sort of - No

Circle one: *I created a personal strategy for at least three difficult items.* Definitely – Yes – Sort of - No

Circle one: *I was very involved and actively studying during the quiz review.* Definitely – Yes – Sort of - No

Circle one: *I think I will be satisfied with the quiz grade I received this week.* Definitely – Yes – Sort of - No

Circle one: *I might need to meet with the instructor outside of class.* Definitely – Yes – Sort of - No