Assessment task notification

Course	Stage 6 Agriculture
Year	Year 11 2024
Task number	Assessment Task 1
Notification date	Wednesday, 13 March 2024
Task Type	Report
Method of issue	Hardcopy from class teacher + copy in class Microsoft Team
Due date and time	Friday, 10th May 2024 by 8:45am
Weighting	30%

Task description

Part A

Students are required to work collaboratively as a class to perform an experimental trial, monitoring the effects of increased dietary protein on the growth rate or yield of livestock. Students will answer questions directly related to the in-class experimental trials. These answers will be completed individually and submitted as a word document.

Part B

Using the given sample experimental trial, students will independently answer questions based on the data presented (please see the 'assessment task details' section for explicit instructions). The answers to this section will also be submitted as a word document on the due date.

Note: the in class experimental trial is collaborative, however answering and submission of questions is to be completed individually by students.

While doing this assessment you are permitted to use:

- your own class notes
- books, journals, or internet resources

- industry specific marketing and products.

Outcomes assessed

P1.2	Describes the factors that influence agricultural systems
P2.2	Describes the biological and physical resources and applies the processes that cause changes in animals production systems
P4.1	Applies the principles and procedures of experimental design and agricultural research

Marking criteria

You will be assessed on how well you:

Answer questions related to the animal nutrition trial you are completing.

Draw conclusions from data and relate to real-world problems.

Please see the marking guidelines at the end of this notification for further detail.

Feedback provided

The teacher will provide feedback outlining strengths and areas for improvement to build on knowledge, understanding and skills for future learning.

Assessment task details

Farm systems

1. Construct a static systems model for the animal trial you have set up at school including, inputs, outputs, processes, and boundaries. — 3 marks

2. Describe any subsystem interactions that occurred during your animal trial. These interactions may include animal, plant, microbe/invertebrate, management and resources. — 4 marks

Animal production

3. Describe two animal welfare requirements that were implemented during the animal trial and outline why these requirements are important. — 4 marks

4. Outline the role of protein in your chosen animal's diet. — 2 marks

5. Identify the stage of growth that your animal is at during the trial and identify the protein requirements for that stage of growth. — 2 marks

6. Describe how the following two factors affected growth and development or yield during the animal trial. — 6 marks

    a. Climatic factors such as temperature, drought, rainfall.

    b. Breeding factors such as genetic variability, age, breed.

Experimental design

7. Explain how you standardised the conditions of your animal trial to ensure only the measured variable was investigated. — 4 marks

8. Identify the control in your trial and explain the purpose of using a control. — 4 marks

9. Explain the importance of randomisation and how this was implemented in your trial. — 4 marks

Total part A — 33 marks

Title

Evaluating the effects of molasses-enhanced commercial grain mix on feedlot cattle.

Aim

Assess the impact of incorporating molasses into cattle feed on the weight gain of steers.

Materials:

100 angus cross steers, 12 months old

Standard feedlot grain mix

Molasses additive

Digital weighing scales

Feeding troughs

Ad lib water troughs

Feedlot yards, same size, shade coverage and access to feeding troughs

Method:

Group allocation:

Randomisation: The 100 steers were randomly allocated to two treatment groups. This randomisation entailed drafting each steer from the crush into one of two treatment groups, either control (group 1) or molasses additive (group 2).

Weight, age and breed criteria: Strict adherence to weight criteria was maintained, with the initial weights of steers ranging from 290-320kg for all steers. This step aimed to ensure that the starting weights of the animals were consistent and balanced. All steers selected for the trials were 12 months old, all born in the same month on a breeding farm and all steers were Angus cross with Brahman.

Feeding regimen:

Group 1 (Control): Group 1 received a daily ration of the standard grain mix.

Group 2 (Molasses): Group 2 received the same grain mix enriched with molasses for enhanced palatability and metabolisable energy (ME).

Experimental setup:

Each treatment group of 50 steers was divided into two yards, with each yard housing 25 steers.

To measure weight gain, 10 steers were randomly selected from each yard at the beginning of each month for weighing.

Weighing scales were used to measure the weight of the selected steers each month for a period of six months.

Results (raw data collected)

Month	Group 1 (kg)	Calculations	Group 2 (kg)	Calculations
1	315, 293, 307, 319, 301, 296, 312, 298, 314, 304	Mean: Std dev:	309, 297, 314, 301, 316, 302, 311, 294, 312, 298	Mean: Std dev:
2	330, 333, 337, 341, 346, 349, 354, 362, 363, 367	Mean: Std dev:	330, 333, 337, 341, 346, 350, 351, 358, 365, 368	Mean: Std dev:
3	366, 375, 384, 385, 392, 392, 399, 405, 407, 417	Mean: Std dev:	383, 384, 389, 397, 400, 408, 410, 416, 419, 428	Mean: Std dev:
4	422, 427, 430, 434, 442, 447, 450, 459, 463, 467	Mean: Std dev:	440, 446, 455, 458, 459, 464, 472, 477, 484, 487	Mean: Std dev:
5	470, 474, 484, 486, 493, 496, 500, 508, 512, 513	Mean: Std dev:	502, 507, 508, 518, 520, 526, 529, 537, 542, 545	Mean: Std dev:
6	510, 517, 519, 526, 529, 534, 544, 545, 554, 555	Mean: Std dev:	559, 567, 574, 576, 579, 589, 589, 598, 602, 609	Mean: Std dev:

Questions

1. Using the data supplied, calculate the means and standard deviation for the two treatment groups in the table above.

   4 marks

2. With specific reference to the data from this trial, would you recommend adding molasses to a standard feedlot grain mix?

   6 marks

   Explain your reasons.

   Total part B

   10 marks

Marking guidelines

Part A

Question	Marking criteria	Marks	Outcome
1	Constructs a thorough static systems model for the named animal trial with a minimum of three for each heading (inputs, processes and outputs.)	3	P1.2
2	Clearly outlines two different interactions that occur between the animal and invertebrate subsystems.	4	P1.2
3	Clearly describes how two species specific animal welfare requirements were met during the animal trial.	4	P2.2
4	Clearly and correctly outlines why protein is required in an animal's diet.	2	P2.2
5	Identifies two stages of growth when animals have a high requirement for protein.	2	P2.2
6	Clearly describes one climatic factor that influences an animal's growth, development or yield. Clearly describes one breeding factor that influences an animal's growth, development or yield.	6	P1.2 P2.2
7	Thoroughly describes how a minimum of four conditions were standardised in your class trial. Clearly links the importance of standardisation in a trial to ensure its validity.	4	P4.1
8	Correctly identifies the control for the class trial. Clearly links the purpose of having a control in a trial to ensure the reliability of the trial, referring to the class trial in the answer.	4	P4.1
9	Clearly links the importance of randomisation in a trial to ensure its validity. Clearly describes how your animal trial was randomised.	4	P4.1

Part B

Question	Marking criteria	Marks	Outcome
10	Correct means and standard deviations for both treatment groups. (4 correct figures).	4	P4.1
11	Clear recommendation is stated and refers to the data to support the recommendation. Clearly links the reasons why they would recommend adding a molasses to a feedlot mix in terms of profitability and increased growth rates.	6	P4.1
Total		/43	

Outcome mapping

Outcome	P1.2	P2.2	P4.1
Marks available	/10	/11	/22