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Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 2 Agricultural and Horticultural Science 2023

91294 Demonstrate understanding of how NZ commercial management practices influence livestock growth and development

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of how management practices influence livestock growth and development in commercial production in New Zealand.	Demonstrate in-depth understanding of how management practices influence livestock growth and development in commercial production in New Zealand.	Demonstrate comprehensive understanding of how management practices influence livestock growth and development in commercial production in New Zealand.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (DO NOT WRITE). This area will be cut off when the booklet is marked.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Achievement

TOTAL 10

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INSTRUCTIONS

You are required to discuss **THREE** livestock species of **your choice**.

BEFORE choosing livestock, carefully read **ALL** the questions to ensure your selections will allow you to meet all the requirements.

QUESTION ONE: Livestock development and feeding

Throughout their life stages, livestock require different types of feed as they grow and develop.

Select your livestock for this question. The livestock you select for this question must be different to those you select for questions Two and Three.

Livestock for Question One:





- (a) How do the growth and development of your chosen livestock change from birth through to the harvest of products? Provide details of the main factors that drive these changes.

B I U    

In the early stages of a calves life, they are feed milk because it has all the proteins and carbohydrates required when they are young, as well as there digestive systems allows cows to only digest milk in the early stages of life. In the early stages of life it is important to feed calves milk because it has all of the required nutrients to maximise growth and development. As calves get older it is important to start adding dry matter into there diet such as grass, calve meal or hay because milk does no longer have the required nutrients for maximal growth and development. Aswell as this it makes sure that there digestive systems is developing as they get only and milk can no longer provide the required nutrients, they can access it of dry matter. Before weaning takes place calves should be able to fully digest grass and dry matter when milk no longer has the required nutrients. This will result in growth increasing and farmer can sell the largest cow at slaughter.

- (b) Evaluate how growers adapt their practices to match seasonal changes in feed supply to ensure growth and development are not compromised.

In your answer consider the impact on the economics of production and timing.

B *I* U    

In the first few weeks of a calves life, milk has all of the nutrients for the maximum growth and development. Aswell as this the calves doesnt have the required digest system for dry matter such as grass or calves feed. As the calves get older slowly introducing dry matter will develop the calves rumen. Once the calves get older digesting dry matter will become able to the calves and as they get older before weaning they will be able to fully digest the dry matter. At weaning it is important that calves have a fully developed rumen in order to digest grass properly, a calves with an underdeveloped rumen at weaning wont be able to maximise the nutrients provided from the dry matter. Making sure calves rumen is fully developed will mean calves can digest the required nutrients in order to increase their growth and development. This will mean when it comes times to slaughter calves with a fully developed digestive system will have grown and developed, meaning they will be larger and can be sold for more. This will increase the farmers sales. Aswell as this, at weaning a calves with an undeveloped rumen wont be able to digest grass and feed properly, this means that the farmers is wasting money on valuable feed.

Page 2

QUESTION TWO: Livestock health

To ensure that livestock are able to reach their potential for growth and development, producers must carry out animal health practices throughout the life of the livestock.

Select your livestock for this question. The livestock you select for this question must be different to those you select for questions One and Three.

Livestock for Question Two:

Select your health practice for your chosen livestock.





Health practice:

(a) How does this animal health practice have a positive impact on the growth and development of your chosen livestock?

B *I* U    

Wooden shelters are health practise which are common on pigs farms. Shelters need to have enough room for the pigs to move around and get out and have hay to bed in. Shelters have a positive impact on the growth and development of pigs because they have somewhere for protection. In the winter months when temperature get low and rain is consistent, shelters are a health practise which protect them from these harsh conditions. This means that there ability to stay warm is increased, because without the shelter the pigs will be using there energy in order to keep warm, rather than to grow. Shelters means that pigs are maximising the food eaten and rather than trying to stay warm they are growing. Additionally during these months pigs can be very prone to disease whem it is and cold, having a wooden shelter provides a place for warmth and dosnt run the risk of pigs catching a disease. This will means that there growth and development is increased. Additionally in the summer months when temperatures are high, shelters provide shade for the pigs. Pigs do not have sweat glades meaning they can not cool down. When a pig is hot it will stress reducing it ability to grow.

- (b) Evaluate the effectiveness of this health practice by explaining how the improvements in growth and development impact the quality of the products and the economics of production.

B *I* U    

Wooden shelters are very effective health practise, this is because during the winter months when temperatures get low and rain is often it means that pigs become very prone to disease. This means that providing a shelter can keep pigs warm and in order and reduce the risk of disease, improving there growth and development. Additionally when pigs get cold they shiver in order to keep warm. Without shelters pigs will be using the energy provided from the food to keep warm rather than to grow. The shelters allow them to improve there growth and development as they are no longer trying to keep warm but rather then to grow. This means that the farmer is maximising his expense spent on food, rather than wasting money. Additionally in the summer months when temperature get hot, pigs need shade which is provided in the form of the wooden shelter. This is because pigs do no have a sweat gland which means that they are prone to the heat. When pigs get hot they realise a stress hormone which is bad for the health of the pig. The stress hormone makes the pig cease up and pant spending it energy trying to keep cool rather than to grow. Aswell as this this has a negative effect on the quality of the pork because a stress hormone is realised which makes the meat tough and promotes a poor flavour and poor quality which isn't desired by the consumers. This means that the profits spend on the pig, food and wooden house would be wasted as they meat cannot be sold. Providing wooden houses means that pigs don't face health problems, are able to stay cool during the winter months and in the summer time they can keep cool and remain a high quality meat while improving there growth and development. The cost of the initial set up of the wooden houses can be expensive along with the cost of maintenance but the benefits that come with the increaed health benefits of the pigs outweigh this cost.

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QUESTION THREE: Breeding practices

The breeding practices chosen by livestock producers can have an important impact on the growth and development of the resulting offspring.

Select your livestock for this question. The livestock you select for this question must be different to those you select for questions One and Two.

Livestock for Question Three:

Select a breeding practice for your chosen livestock.

Breeding practice:

(a) How does this breeding practice impact the growth and development of the offspring that result from this practice?

B *I* U    

Artificial insemination is the process of artificial inseminating sheep, with a trained technician with the desired ram. This means that the farmer can choose a ram with the ideal genetics in order to achieve the best quality sheep. For, example, if the farmer wants a larger more woolly ewe in order to deal with the harsh elements better, the farmer would purchase from a Romney Ram. This is because they are more resistant to the harsh elements and the offspring wont struggle putting on condition. This means that the offspring of the ewe is going to be more risistant to the cold and can put on more size, without having to use its energy to keep warm but rather to put on size.

- (b) Evaluate the use of this breeding practice in terms of growth and development by comparing it with an alternative breeding practice.

In your answer discuss the impacts on the quality and quantity of livestock produced from these practices.

B *I* U    

Artificial insemination is management practise performed by certified technicians and can be challenging to find technicians for the job. Natural breeding is another breeding practise which can be used. Artificial insemination means that the farmer can chose desired traits, such as woolly ewes to fit the needs of there offspring. This technique is used to increase the growth and development of the offspring because they can chose traits which the ewes offspring to obtain. This can improve the quality of lambs because farmers can chose rams which will benefit the farm and the landscape around them. Aswell as this artificial insemination is performed by technicians and the cost of getting them on farm along with the ram semen can be expensive, but the cost or transporting the semen is minimal and farmers can get semen from across the country. Natural breeding requires the transport of rams through trucks, this can be very costly and it also runs the risk of the rams getting sick or dying. It is also much harder to get rams from a long distance away compared to Artifical insemination. This can be a waste of money for the farmer. Arifical insemination if not performed right, the chance of a ewe getting pregnant can be around 80% while natural breeding is significantly higher. Artifical insemination also requires perfect time as they ewes need to be on heat to inseminate and the window for insemination is around 24 hours. In natural breeding the rams can detect when the ewes are on heat and the chance of them getting in lamb increased.



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New Zealand Qualifications Authority

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Achievement

Subject: Agricultural and Horticultural Science

Standard: 91294

Total score: 10

Q	Grade score	Marker commentary
One	A4	The candidate included feeding, which was not required, but within this did give the necessary discussion of changes to growth and development throughout life.
Two	A3	The candidate gave sufficient information on the impacts on growth and development.
Three	A3	The candidate provided reasons for how artificial insemination can be used to improve growth and development but did not make strong links.