Assessment Schedule – 2023

Agricultural and Horticultural Science: Demonstrate understanding of how NZ commercial management practices influence livestock growth and development (91294)

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding involves describing how management practices influence livestock growth and development in commercial livestock production.	*Demonstrate in-depth understanding* involves explaining how management practices influence livestock growth and development in commercial livestock production.	*Demonstrate comprehensive understanding* involves evaluating how management practices influence livestock growth and development in commercial livestock production, by justifying, comparing, contrasting, or analysing.

Question ONE: Livestock development and feeding

	Sample evidence
(a)	Explains how the growth and development of chosen livestock change from birth through to the harvest of products. *Deer* • Young deer initially focus on increasing their body size, getting larger in size. Their digestive system also develops as they move from digesting milk to digesting grass. To enable this to happen, their rumen must get larger with more bacteria. • As the deer approaches the time when it can be slaughtered for venison, the grower shifts focus from increasing the deer size to developing muscle. When the fawn is first born, it needs to receive a large volume of high-quality milk from its mother to enable it to grow to its maximum size as this is its primary source of food. If the hind is not fed enough, she will not produce enough to feed her fawn to allow it to grow large. As the fawn gets older, it needs to be provided quality, leafy pasture so that it can shift digestion from the abomasum to the reticulum. Receiving high quality, leafy pasture or similar will enable the rumen to grow larger, with greater numbers of bacteria. This larger, more developed rumen will be able to digest greater volumes of grass as it gets older, allowing the deer to continue to develop greater muscle and grow a larger body frame so that the meat may be sold as venison.
(b)	Evaluates how the growers adapt their practices to match seasonal changes in feed supply to ensure growth and development are not compromised. • Pasture growth is seasonal so in the winter months there is less available. Although the feed intake requirements of deer also drop in the winter, it is not always sustainable for farmers to rely on pasture alone. Deer are programmed to make the most of summer growth. Growers must ensure that this pasture is available. However, if there is a drought in the summer there may not be enough pasture available. If the deer does not have enough leafy pasture available either during low growth periods in winter, or during a drought in summer, it will not be receiving enough nutrients to grow and develop large enough to be sold as venison. The grower may need to keep the deer for longer to ensure it meets the optimum weight. The grower will need to keep the deer on the property longer, increasing the operational costs and taking longer to receive a profit. • To overcome this shortfall, the grower could make baleage / silage or hay in the spring to supplement in either winter or summer. They could also plant a summer forage crop such as chicory, clover, or lucerne to supplement the lower pasture levels. Growers could also irrigate pastures in summer to provide the water that is needed for plant growth, increasing the amount of pasture available for the deer.

	• By providing supplementary feed, either as conserved pasture or as a forage crop, or irrigating pasture in summer, the grower is ensuring the deer will be receiving enough nutrients to grow and develop large enough to be sold as venison. Although these practices will cost the grower additional money, this will be offset by the earlier time that the deer can be sent to the processing plant, ensuring they meet the size requirements, and the grower can receive the maximum profit for the deer.

N1	N2	A3	A4	M5	M6	E7	E8
Partially describes how the growth and development of livestock changes from birth through to the harvest of products, but insufficient description.	**Partially describes** how the growth and development of livestock changes from birth through to the harvest of products.	**Describes** how the growth and development of livestock changes from birth through to the harvest of products.	**Describes in detail** how the growth and development of livestock changes from birth through to the harvest of products, with reference to growth rates.	**Explains** what impacts how the growth and development of livestock changes from birth through to the harvest of products.	**Explains in detail** what impacts how the growth and development of livestock changes from birth through to the harvest of products.	Discusses how growers adapt their practices to match seasonal changes in feed supply to ensure growth and development is not compromised by considering the impacts on economics of production and timing. Comprehensive evidence for superiority in ONE of these aspects, with the remaining aspect well supported.	Discusses how growers adapt their practices to match seasonal changes in feed supply to ensure growth and development is not compromised by considering the impacts on economics of production and timing. Comprehensive evidence for superiority in BOTH aspects.

N0 = No response; no relevant evidence.

Question TWO: Livestock health

	Sample evidence
(a)	Discusses how a health practice can have a positive impact on the growth and development of livestock. *Pigs* • Pigs can be drenched for internal parasites. This results in any internal parasites within the animal being killed. • Internal parasites live in the small intestine and attach to the wall of the intestine, sucking the nutrient-rich blood. This reduces the amount of nutrients available for the animal, which would reduce growth rates. By killing off any internal parasites, it ensures that the animal has all the nutrients available for use from its food. This helps the animal in growing larger and being able to further develop.
(b)	Evaluates the effectiveness of the health practice in terms of improving growth and development. Internal parasites live in the small intestine of the pig and attach to the wall of the intestine, sucking the nutrient-rich blood. This reduces the amount of nutrients the pig receives and reduces growth rates. As the farmer pays for housing, bedding, supplementary feeds, etc. any loss of nutrients from these practices will result in lower returns from inputs. Piglets are more susceptible to internal parasites and as they are going through the largest increase in body size, any restrictions to nutrition will result in an animal that is smaller than its genetic potential. This will reduce the future production of the animal meaning the farmer will never be able to receive the maximum amount of profit off this animal. Older pigs will also see a reduction in production as the internal parasites will be using some of the nutrients that the animal would otherwise use for muscle growth. This will also result in lower profits for the farmer. The pigs will also have a smaller muscle mass, which will reduce the quality of the meat as it does not meet the size requirements, devaluing it. Stress can also cause the meat to become less tender, further reducing the quality. Although drenching does cost the farmer to purchase, and will involve additional labour hours to administer it, by killing off any internal parasites, it ensures that the animal is able to use all the nutrients from its food for growth and development, producing high quality pork. This will ensure that young stock meet the genetic potential for size, allowing it to maximise production and increase profit for the farmer. Older animals will also ensure that all nutrients obtained from the diet are utilised for growth and therefore all the money that the farmer spends on feed production will result in an economic benefit for the farmer.

N1	N2	A3	A4	M5	M6	E7	E8
Partially describes how a livestock health practice can positively impact on growth and development but gives an insufficient description.	**Partially describes** how a livestock health practice can positively impact on growth and development	**Describes** how a livestock health practice can positively impact on growth and development.	**Describes in detail** how a livestock health practice can positively impact on growth and development.	**Explains** how a livestock health practice can positively impact on growth and development, linking to growth rates.	**Fully explains** how a livestock health practice can positively impact on growth and development, linking food utilisation and energy intake to growth rates.	**Evaluates** the effectiveness of this livestock health practice by explaining how the improvements in growth and development impact on the quality of the products and the economics of production. Comprehensive evidence for superiority in ONE aspect, with the other aspect well supported.	**Evaluates** the effectiveness of this livestock health practice by explaining how the improvements in growth and development impact on the quality of the products and the economics of production. Comprehensive evidence for superiority in BOTH aspects.

N0 = No response; no relevant evidence.

Question THREE: Breeding practices

	Sample evidence
(a)	Discusses how a breeding practice impacts the growth and development of young stock resulting from this practice. *Sheep: Sire selection* When selecting which rams to use with their ewes, producers will consider several characteristics in both the ram and ewe. The ram selected will need to have a high likelihood of passing on traits that improve on those of the ewe and meet the breeding objectives of the farmer. They will select rams that will produce lambs that grow larger and faster to ensure that they become larger sheep with a greater amount of muscle. A larger animal will also grow a greater volume of wool. The farmer could also select rams that produce lambs that develop finer wool and / or convert feed more efficiently into meat / wool, which means a greater growth of body size and / or development of products.
(b)	Evaluates the use of this practice in terms of growth and development by comparing it with an alternative breeding practice. Instead of selecting better quality rams for breeding, the farmer could flush the ewes to increase the number of lambs born. Flushing involves feeding the ewe high-quality leafy pasture before mating to 'trick' her body in to releasing multiple ova so that she gets pregnant with twins or triplets. This will increase the number of lambs born so the farmer will have a greater quantity of lambs to sell and receive profit from. However, this practice does not improve the quality of the livestock, just the total number. When selecting high-quality rams for mating, the farmer is hoping that the next generation of lambs will be larger than the previous. During the growth phase, the lamb should grow bigger than the lambs from the year before, if provided with the correct amount and type of food. As the farmer can select for both size and quality, these lambs will be larger, with more muscle of a high quality, so even though there are fewer of them than if flushing were done, there would be a greater volume of high-quality meat for the farmer to sell. A greater number of lambs from flushing also increases the workload for the farmer, giving more lambs to dock, vaccinate, etc. which would increase the quantity of lambs requiring treatments. These additional lambs also require more feed and may take longer to reach the desired size and quality for sale, as they may also be born smaller so take longer to reach the required size.

N1	N2	A3	A4	M5	M6	E7	E8
Partially describes how a breeding practice impacts on the growth and development of the young stock that result from this practice but gives an insufficient description.	**Partially describes** how a breeding practice impacts on the growth and development of the young stock that result from this practice.	**Describes** how a breeding practice impacts on the growth and development of the young stock that result from this practice.	**Fully describes** how a breeding practice impacts on the growth and development of the young stock that result from this practice, making some reference to growth and development.	**Explains** how a breeding practice impacts on the growth and development of the young stock that result from this practice.	**Fully explains** how a breeding practice impacts on the growth and development of the young stock that result from this practice, linking this practice to increased growth and development.	**Justifies** the use of this breeding practice in terms of growth and development by comparing it with an alternative breeding practice, discussing the impacts on the quality and quantity of livestock produced from these practices. Comprehensive evidence for superiority in TWO aspects, with the other aspect well supported.	**Justifies** the use of this breeding practice in terms of growth and development by comparing it with an alternative breeding practice, discussing the impacts on the quality and quantity of livestock produced from these practices. Comprehensive supporting evidence for superiority in ALL aspects.

N0 = No response; no relevant evidence.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 12	13 – 18	19 – 24