

Assessment Schedule – 2014

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

Evidence Statement

Question ONE: Protective environments

Achievement	Achievement with Merit	Achievement with Excellence
<p>Describes how providing pigs with adequate space improves their growth and development.</p> <p>OR</p> <p>Describes how these farrowing practices impact on the piglets' growth and development.</p>	<p>Explains how providing pigs with adequate space improves their growth and development.</p> <p>OR</p> <p>Explains how these farrowing practices impact on the piglet's growth and development.</p>	<p>Compares and contrasts the two different farrowing practices by their impacts on quantity and economics of production.</p>

N0	No response; no relevant evidence.
N1	Some writing, but does not describe how adequate space or farrowing practices affects the piglets' growth and development.
N2	Partial or insufficient description of how adequate space or farrowing practices affects the piglets' growth and development.
A3	Describes how adequate space or farrowing practices affect the piglets' growth and development.
A4	Fully describes how adequate space or farrowing practices affect the piglets' growth and development, with reference to growth rates.
M5	Explains how adequate space or farrowing practices affect the piglets' growth and development, linking to growth rates.
M6	Fully explains how adequate space or farrowing practices affect the piglets' growth and development, linking food utilisation or energy or protein intake to growth rates.
E7	Compares and contrasts the two different farrowing practices by their impacts on quantity and economics of production. Comprehensive evidence for superiority in ONE aspect, with the other aspect well supported.
E8	Compares and contrasts the two different farrowing practices by their impacts on quantity and economics of production. Comprehensive supporting evidence for superiority in BOTH aspects.

Q1	Evidence
(a)	<p>Describes <u>how providing pigs with adequate space improves their growth and development</u></p> <p>Pigs need to be able to stand, move about, lie down without touching another pig, and also have areas which are used for dung, feeding, and lying. The industry has determined that the minimum lying space allowance for growing pigs should be: Area (m²) per pig = 0.03 x liveweight (kg). This space allowance ensures that the pigs are comfortable throughout their growth and development, regardless of the weather. As pigs cannot sweat, air movement is required for their cooling. Enough space therefore needs to be provided to allow pigs in a pen to lie on their sides without the need to have body contact with other pigs. However, during the winter months, the living space needs to be warm enough to reduce huddling or inappropriate dunging patterns.</p> <p>Pigs are hierarchical animals and will seek to establish a social structure, which may result in aggression. Aggression can also occur at feeding times, and is displayed by bullying, fighting, and biting. By ensuring that a pen has room for the pigs to move away, or contains baffles such as bales of straw that pigs can hide behind, such aggression can be reduced.</p> <p>In addition to having enough space, pigs should have access to sufficient food and water, and be able to display normal patterns of behaviour, as this minimises the likelihood of unreasonable or unnecessary pain or distress from other pigs. It also provides protection from, and rapid diagnosis of, any significant injury or disease, and minimises injuries during any aggression from social rank fighting.</p> <p>Explains <u>how providing pigs with adequate space improves their growth and development</u></p> <p>By having adequate space, instead of fighting for room, the pigs are able to maximise their growth rates, as they can spend more time foraging for food, ensuring that they have a higher intake and better utilisation of the feed. This results in greater growth and faster liveweight gain. Higher feed intake increases digestion and absorption of food nutrients, therefore maximising the intake of digestible energy and protein required for growth, and for muscle and tissue development.</p>

(b)	<p>Describes the difference between farrowing crates and farrowing huts</p> <p>Farrowing crates are used indoors, and are enclosures designed for a sow to farrow in and rear her piglets until weaning. The main purpose of the farrowing crate is to protect the piglets from being laid on by the sow or being trampled by her. The bars on the farrowing crate enable the sow to lie down comfortably, with minimal risk to the piglets. Just to the side of the farrowing crate, there is a specially heated warm environment designed for the piglets, called a creep area.</p> <p>A farrowing hut is used in outside pig production. This is an individual accommodation for the sow where she can rest while farrowing. There is no separate area for the piglets.</p> <p>The conditions within the farrowing crate and hut allow the piglets to grow faster.</p> <p>Explains how these farrowing practices impact on the piglet's growth and development</p> <p>Both farrowing practices ensure that the sow is in a safe, dry, and warm environment where she is able to farrow free from other pigs. The sow does not compete for food, thus ensuring that milk production is high. When piglets are born healthy and are supplied with sufficient milk, they grow at their optimum rate and reach a higher liveweight earlier. A higher milk intake by the piglets increases digestion and absorption of nutrients, therefore maximising the intake of digestible energy and protein required for growth and tissue development.</p> <p>Compares and contrasts the two different farrowing practices by their impacts on quantity and economics of production</p> <p>A farrowing crate is designed to reduce the number of piglets that are killed by crushing, trampling, or being laid on by the sow. The creep area also reduces piglet mortality from hypothermia and starvation. As the piglets are all contained in the crate area, the farmer is able to easily catch them, and any health problems, including diseases, in the sow or litter are more easily detected and treated. By minimising preventable piglet deaths, the quantity of pigs produced is higher than that from farrowing huts, and therefore the financial income is also higher.</p> <p>As a farrowing hut has no separate area for the piglets to get away from the sow, standards of animal welfare are reduced and piglet deaths are higher, resulting in lower economic returns. If the sow does not farrow in the preferred location in the hut, the piglets are exposed to increased risk from being laid on and chilling. Also, the sow may abandon the farrowing site or litter, causing the piglets to starve, chill, or get sick from lack of colostrum intake. It is also more difficult to catch the piglets to check for illness, and more dangerous for the farmer, as the sow tries to protect her piglets.</p> <p>Indoor pig production has higher set-up costs, due to the building of an indoor environment, but requires less land. Outdoor pig production has lower set-up costs, but requires a larger amount of land for the pigs to forage.</p> <p>Farrowing huts tend to produce lower numbers of piglets to weaning than crates, and therefore often have a lower economic return. However, prices can be higher, as the pork is sold as free range, and the resulting higher income may partly or wholly offset the disadvantage of lower piglet production.</p>
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Question TWO: Weighing at tailing

Achievement	Achievement with Merit	Achievement with Excellence
Describes how weighing impacts on the lamb's growth and development.	Explains how weighing impacts on the lamb's growth and development.	Analyses whether weighing should or should not occur at tailing, to ensure that the lambs meet the Christmas lamb market, and its effect on economics of production.

N0	No response; no relevant evidence.
N1	Some writing, but does not describe how weighing affects livestock growth and development.
N2	Partial or insufficient description of how weighing affects livestock growth and development.
A3	Describes how weighing affects livestock growth and development.
A4	Fully describes how weighing affects livestock growth and development, with reference to growth rates.
M5	Explains how weighing influences livestock growth and development, linking to growth rates.
M6	Fully explains how weighing influences livestock growth and development, linking pasture utilisation <i>OR</i> energy <i>OR</i> protein intake to growth rates.
E7	Analyses whether weighing should or should not occur at tailing, to ensure that the lambs meet the Christmas lamb market, and its effect on economics of production. Comprehensive evidence for superiority in ONE aspect, with the other aspect well supported.
E8	Analyses whether weighing should or should not occur at tailing, to ensure that the lambs meet the Christmas lamb market, and its effect on economics of production. Comprehensive supporting evidence for superiority in BOTH aspects.

NB: Economics of production = increase in quality or quantity of lambs sold

Q2	Evidence
	<p>Describes how weighing is carried out</p> <p>Due to the use of electronic identification tags, farmers are choosing to start monitoring lambs' weights as soon as they can. Lambs are weighed by standing or lying them on a set of scales. It is done to monitor growth weights of the individual lambs, and their health, and used to make feed decisions to increase their liveweight gain.</p> <p>Explains how weighing impacts on the lamb's growth and development</p> <p>Weighing at tailing allows the farmer to monitor lamb growth rates throughout the lactation period and beyond, and thus match the lamb's and its mother's nutrient and feed requirements with the pasture available. The farmer is able to accurately plan feeding and grazing regimes, to ensure that the lambs have optimum pasture available at all times. This leads to higher feed intake and better utilisation of pasture, which results in greater growth and higher liveweight gain. Higher feed intake increases digestion and absorption of food nutrients, therefore maximising the intake of digestible energy and protein required for growth and tissue development.</p> <p>Explains whether weighing at tailing would improve the time of production to meet the Christmas lamb market, and evaluates the economic advantages and disadvantages of weighing at tailing</p> <p>By being able to monitor growth rates through weighing, the farmer is able to meet the market-required weight range for the Christmas market sooner, as they have a better idea of what growth rates their lambs are achieving. They are able to increase the quality and quantity of feed to lambs that require it, and therefore more lambs will meet that market-required weight range in a quicker timeframe. Having a larger number of lambs being selected on weight to go to the works sooner, maximises profit. Weighing at tailing ensures that the farmer is able to supply more lambs to that market, and therefore it is a wise decision. However, by carrying out weighing at tailing, expenses are higher, due to the need for a set of portable scales and an extra labour unit; it will also take extra time. However, by having a better feeding regime, production should be earlier and higher, offsetting the extra costs.</p>

Question THREE: Paddock conditions for livestock

Achievement	Achievement with Merit	Achievement with Excellence
<p>Describes how fencing manages the effective utilisation of pasture to improve the quality of pasture and livestock.</p> <p>OR</p> <p>Describes the advantages of using off-pasture, purpose-built housing, rather than leaving calves out in the paddocks.</p>	<p>Explains how fencing manages the effective utilisation of pasture to improve the quality of pasture and livestock.</p> <p>OR</p> <p>Explains how utilising a purpose-built house would affect the quality and quantity of calves produced.</p>	<p>Justifies the financial expense of purpose-built housing in calf-rearing, rather than raising the calves outside, to improve the quality and the quantity of the calves.</p>

N0	No response; no relevant evidence.
N1	Some writing, but does not describe how fencing or the use of off-pasture, purpose-built housing influences livestock growth and development.
N2	Partial or insufficient description of how fencing or the use of off-pasture, purpose-built housing influences livestock growth and development.
A3	Describes how fencing or the use of off-pasture, purpose-built housing influences livestock growth and development.
A4	Fully describes how fencing or the use of off-pasture, purpose-built housing influences livestock growth and development, with reference to growth rates.
M5	Explains how fencing or the utilisation of a purpose-built house influences the quality or quantity of livestock growth and development, linking to growth rates.
M6	Fully explains how fencing or the utilisation of a purpose-built house influences the quality OR quantity of livestock growth and development, linking energy intake to growth rates.
E7	Justifies the financial expense of purpose-built housing in calf-rearing, rather than raising the calves outside, to improve the quality and the quantity of the calves. Comprehensive evidence for superiority in ONE aspect, with the other aspect well supported.
E8	Justifies the financial expense of purpose-built housing in calf-rearing, rather than raising the calves outside, to improve the quality and the quantity of the calves. Comprehensive supporting evidence for superiority in BOTH aspects.

Q3	Evidence
(a)	<p>Describes how fencing manages the effective utilisation of pasture to improve the quality of pasture and livestock</p> <p>Fencing land into paddocks gives the farmer greater control over where and what the livestock eat. The farmers are able to use fencing to determine stocking rate, the length of time on the pasture, how long to rest the pasture, and the type of pasture provided.</p> <p>Fencing also ensures that parasite burdens are easier to control if the farmer is able to rotate stock through a number of paddocks and avoid grazing animals on contaminated pasture. Parasites impede stock growth and development, as they live inside or on their skin, feeding on the animals' nutrients.</p> <p>Appropriate fencing keeps pasture quality high and enables livestock to gain liveweight.</p> <p>Explains how fencing manages the effective utilisation of pasture to improve the quality of pasture and livestock</p> <p>Fencing ensures that the livestock are able to have the quality and the quantity of feed required for them to grow and develop at their optimum rate. Farmers can create clean pasture with low parasite burdens by resting paddocks and controlling contamination. This leads to higher feed intake and better utilisation of feed, keeping the stock in good condition.</p> <p>Fencing maximises pasture growth rates, enabling the stock to grow to a mature size, as it provides higher feed intake and better utilisation of pasture, which results in greater growth and higher liveweight gain. Higher feed intake increases digestion and absorption of nutrients, therefore maximising the intake of digestible energy and protein required for growth, muscle, and tissue development.</p>
(b)	<p>Describes the advantages of using off-pasture, purpose-built housing, rather than leaving calves out in the paddocks</p> <p>Off-pasture, purpose-built housing shelters the calves from all kinds of weather, in particular the wind, sun, rain, storms, frost, and the cold. Basically, they minimise the effects of adverse weather conditions. Calves are particularly vulnerable to cold and wet conditions, and can die if left wet or cold for too long. Eliminating these factors improves calf growth rate. Being off the pasture also means that they stop pugging, compacting and/or over-grazing the paddocks during wet periods, enabling better utilisation of pasture.</p> <p>Explains how utilising a purpose-built house would affect the quality and quantity of calves produced</p> <p>Warm and dry calves mean a higher quantity of calves kept alive, than if the calves are left out in the paddock cold and wet, where they can succumb to adverse weather conditions. Calves using purpose-built housing have lower feed requirements during cold and wet conditions, as less energy is required to keep them warm, compared to calves that are left in the paddock. More of the calf's feed intake can be utilised directly for growth and development rather than for producing heat energy, which results in greater growth rates and higher liveweight gain. Higher feed intake increases digestion and absorption of food nutrients, therefore maximising the intake of digestible energy and protein required for growth, and for muscle and tissue development, contributing to faster growth rates. This means that more of the calves will reach their targeted weight earlier.</p> <p>Justifies the financial expense of purpose-built housing in calf-rearing</p> <p>A purpose-built house for calf-rearing is a necessity whatever the cost, rather than a luxury item. It is an asset to a farmer and a justifiable outlay. Utilisation of the house eliminates the adverse winter weather conditions that calves would otherwise be exposed to, and ensures that the farmer has a higher number of live calves. The house also enables better-quality calves at higher weights to be produced. The financial gains achieved by having a higher number of quality calves raised offsets the financial outlay of constructing the calf shed.</p>

Cut Scores

	Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
Score range	0 – 7	8 – 12	13 – 18	19 – 24