

Assessment Schedule – 2012

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

Evidence Statement

Question	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
ONE	Breed selection			
(a)	The breed shown in the photograph is Hereford. The Hereford breed of cow and the Angus bull are both early maturing breeds of cattle. The resulting crossbred calf will inherit the characteristics of early maturity from both parents, resulting in the calf being of smaller, shorter stature, and having passed through the stages of growth at a faster rate than late maturing breeds, growing at an average rate and depositing muscle and fat tissue at an earlier age than other breeds.	In (a) Describes in general terms how the breed of calf impacts on growth rate and tissue development.	In (a) Explains how the early maturing characteristics of the breed of cow and bull impact on growth rate and tissue development.	In (b) Justifies the use of early maturing breeds such as Hereford and Angus cattle, based on their suitability to conditions and ability to produce cattle with desirable carcass characteristics.
(b)	The Hereford and Angus breeds are early maturing, while breeds such as the Charolais are late maturing. The different maturity rates are reflected in differences in the mature size and fat cover. The use of late maturing breeds would appear desirable, because they can be grown to heavier live weights without becoming over-fat and hence provide a higher financial return. However, the early maturing breeds such as the Angus and Hereford are more adaptable, having been bred for harsh, cold conditions and where pasture quantity and quality are variable and not conducive to fast growth rates. Angus and Hereford will graze widely and derive maximum nutrition for milk production for calves. Breeds such as the Charolais require the best of conditions in order to achieve to their potential, and their survival rates are reduced in the conditions likely to be found on this property. The early maturing breeds allow for cattle to be reared to 2 years of age, at which time they will be prime and fit for slaughter. Later maturing breeds will require further feeding or be killed at lower than desired weights.	OR In (b) Describes in general terms how cattle breed impacts on nutritional factors, with reference to growth rate and carcass quality.	OR In (b) Explains in detail how cattle breed impacts on nutritional factors, with reference to growth rate and carcass quality.	

Not Achieved	N1	Some writing, but does not give any details of breed of cow or its maturity rate.
	N2	States that these breeds were bred for beef production.
Achievement	A3	Describes the TWO breeds and refers to their early maturity or suitability to the high country environment on the property.
	A4	Describes how early maturity affects tissue development.
Merit	M5	Explains the significance of early maturity <i>OR</i> hardiness in relation to the high country property.

Merit	M6	Explains the significance of early maturity <i>AND</i> hardiness in relation to the high country property.
Excellence	E7	Justifies the farmer's decision to use these breeds rather than Charolais and Simmental breeds on the basis of TWO aspects from: grazing conditions, hardiness, and ability to survive and grow. Reasons fully explained with comprehensive, supporting evidence.
	E8	Justifies the farmer's decision to use these breeds rather than Charolais and Simmental breeds on the basis of ALL of the following: grazing conditions, hardiness, and ability to survive and grow. Reasons fully explained with comprehensive, supporting evidence.

N0 = No response; no relevant evidence.

Question	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
TWO	Pre-slaughter management practices			
(a)	<p>Management practices for:</p> <p><i>Tailing (without castration)</i></p> <p>The choice of not castrating ram lambs would be appropriate, given the good pasture growth and optimum milk intake from the ewes. The presence of testosterone allows for increased muscle development and minimises fat deposition. The high level of nutrition and hormone influence should be reflected in high growth rates of around 300 g/day, enabling the lambs to reach desired heavy liveweights in excess of 40 kg. The use of cryptorchids could be considered if there was any concern as to the ability to have all male lambs killed in their first year.</p>	<p>Describes in general terms how TWO of the management practices influence growth and development.</p> <p>OR</p> <p>Describes in general terms how the recommended drafting practice <i>AND</i> one other practice contribute to the production of desirable carcasses.</p>	<p>Explains in detail how TWO of the management practices influence growth and development.</p> <p>OR</p> <p>Explains in detail how the recommended drafting practice <i>AND</i> one other practice contribute to the production of desirable carcasses.</p>	<p>Justifies the continued use of the tailing (without castration) and weaning practices, as well as implementing the recommended drafting policy when producing high-grade lambs on this property.</p>
(b)	<p><i>Weaning</i></p> <p>Leaving the lambs with their mothers would overcome any weaning check that would be suffered if weaned at an earlier age, resulting in a reduced growth rate for a short period following weaning. Given that quality feed is plentiful and that milk production could be sustained for a longer period, the ongoing intake of a high level of high-protein feed is conducive to muscle development and a high growth rate. Ewes will compete with their lambs for clover, but overall, a delay to weaning in these circumstances is acceptable.</p>			
(c)	<p><i>Drafting</i></p> <p>Drafting all lambs once a month on the basis of liveweight is not desirable. At this time interval, many ewe lambs will deposit fat at a rate that would result in their carcasses being graded in the high fat grades – the heavier the ewe lamb, the more likely it is that over-fat carcasses will be produced. Ram lambs, not castrated, will use more of their feed intake for growth rather than fat deposition; however, some will move into a higher fat grade within the 30-day period.</p>			

(d)	<p>The advice to separate ram and ewe lambs at drafting, and to draft every two weeks using weighing equipment and physically handling lambs, would support the production of heavy weight, low-fat carcasses favoured by the market. The tailing and weaning policy is conducive to the best use of an abundant supply of quality feed, and allows all lambs to grow at high rates of liveweight gain, mainly through muscle development. Having the ability to produce high-liveweight lambs must be balanced by considering the fat component of the liveweight, and the drafting policy is essential to the decision as to which lambs are in a desirable condition for killing – high liveweight, but minimal fat cover. It is easier for the drafter to draft lines of ram or ewe lambs, because there is less chance of error when relying on estimation of fat cover by feeling the loin region. Frequent drafting means there is less time for lambs to gain fat that would result in an over-fat grade and reduced payment. Weighing lambs to gain liveweight data removes inaccuracies, however estimating weight is less of a difficulty than inaccuracies with fat cover and has a reduced negative financial implication. Judging fat cover on a regular basis is essential – the ability to do so is greatly assisted by separation of the sexes, regular drafting, and use of experienced drafters.</p>			
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Not Achieved	N1	Some writing, but focuses on how only ONE practice is carried out.
	N2	Describes a change to the drafting practice.
Achievement	A3	Describes in general terms the effect of TWO practices on growth or development, eg grows larger more quickly.
	A4	Describes the effect of TWO practices on growth or development, with reference to specific body tissue or growth rates.
Merit	M5	Explains how TWO practices influence growth or development by linking hormones /level of nutrition to growth or development.
	M6	Explains how TWO practices influence growth or development by linking hormones /level of nutrition to growth or development, with reference to carcass grades.
Excellence	E7	Justifies the farmer's choice of existing or changed practices to enhance economic returns through higher weight but lean carcasses, with comprehensive supporting evidence for ONE practice, and the other practice well supported.
	E8	Justifies the farmer's choice of existing or changed practices to enhance economic returns through higher weight but lean carcasses, with comprehensive supporting evidence for BOTH practices.

N0 = No response; no relevant evidence.

Question	Evidence	Achievement	Achievement with Merit	Achievement with Excellence
THREE	Pasture feeding			
(a)	<p><i>Pasture topping in late November/early December</i></p> <p>Removal of the seed head of grass plants will improve pasture quality and increase deer/lamb growth rates. The seed head component is high in lignin, which reduces the digestibility of feed in the ruminant stomach. Topping allows for increased sunlight to clovers which, by virtue of their high digestible energy and protein content, increase growth rates through increased muscle development. Palatability is improved, which encourages livestock to eat more.</p> <p><i>Using pasture regrowth after silage made in November/December</i></p> <p>Cutting and removal of plant material for silage comes after a period of no grazing when root reserves are replenished, so that regrowth is rapid. The regrowth will be mainly leafy material, both grasses and clover, and palatability and digestibility is high. These factors maximise the intake of digestible energy and protein required for growth and tissue development. Pasture regrowth is also low in internal parasites, so all feed consumed is available to the animal for growth and development.</p> <p><i>Rotationally graze and move when 30–50% eaten</i></p> <p>Moving stock on a regular basis maintains an even pasture cover of leafy material without intense or selective grazing, so that clover content is maintained, allowing nitrogen fixation to encourage grass growth. Stock grazing a high pasture cover do not have to undertake extensive movement, therefore more of the available energy component of the feed is used for growth rather than movement. Leafy pasture with minimal dead litter is high in protein (20–24%) and high in digestibility and palatability. Collectively, these attributes enhance growth rates in general and muscle development in particular.</p>	<p>In (a) Describes in general terms how the selected management practice encourages growth and development.</p> <p>OR</p> <p>In (b) Describes in general terms how a second management practice to that selected encourages growth and development.</p>	<p>In (a) Explains in detail how the selected management practice encourages growth and development.</p> <p>OR</p> <p>In (b) Explains in detail how a second management practice to that selected encourages growth and development.</p>	<p>Evaluates the pasture management practices by comparing and contrasting the ability of the practices to supply quality feed for milk production and early fawn growth.</p>
(b)	<p>Deer are grazed behind expensive deer fencing, which limits the area on a farm available for grazing. Deer farmers will require all feed available for hinds for calving. Disturbance at calving time is undesirable, and it is likely that farmers would want to spread hinds for calving. Critical to fawn growth and development is milk production of the hinds at a time when pasture is maturing and losing nutritional value.</p> <p>Topping pastures is possible because pastures have been sown; therefore tractor work can be undertaken, and provided that it is carried out prior to calving, then rank growth is removed and feed quality and milk production is enhanced. A disadvantage would be that deer prefer some natural vegetative cover to hide fawns while hinds are grazing.</p> <p>In comparison, regrowth after silage may appear a reasonable option, but the need to</p>			

	<p>lock up paddocks for silage, while possible, may not suit the need to match available pasture growth at a time of increased demand from pregnant hinds. If undertaken, then the same difficulty with deer behaviour exists, but clean and safe pasture quality would be conducive to milk production and pasture intake by young fawns. Both topping and silage-making involve mechanical work, however making silage from paddocks not grazed by deer is a more likely option.</p> <p>Rotational grazing requires a number of fenced paddocks, which may be possible, but is not desirable at the time of year when the pasture is beyond the leaf stage and movement of young stock may cause mothering difficulties.</p>			
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Not Achieved	N1	Some writing, but the effect of only ONE practice is described.
	N2	Describes TWO practices, but does not link to growth and development.
Achievement	A3	Describes in general terms the effect of TWO practices on growth or development.
	A4	Describes the effect of TWO practices on growth or development, with reference to specific body tissue or growth rates.
Merit	M5	Explains how TWO practices influence growth or development by linking hormones /level of nutrition to growth or development.
	M6	Explains how TWO practices influence growth or development by linking energy and protein intake to growth rates.
Excellence	E7	Justifies the selected management practice by comparing the benefits with another practice in terms of management <i>AND</i> growth rates. Comprehensive evidence for superiority in one aspect, with the other aspect well supported.
	E8	Justifies the selected management practice by comparing the benefits with another practice in terms of management <i>AND</i> growth rates. Comprehensive supporting evidence for superiority in BOTH aspects.

N0 = No response; no relevant evidence.

Judgement Statement

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