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Mark Scheme (Results)

June 2018

Pearson BTEC Level 3 - Animal
Management / Animal Management
with Science

Unit 1: Animal Breeding and Genetics



Animal Management

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June 2018

Publications Code 31644H_1806_MS

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Unit Unit 1: Animal Breeding and Genetics – 1806 marking grid

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Marking grids should be applied positively. Learners must be rewarded for what they have shown they can do, rather than be penalised for omissions.
- Examiners should mark according to the marking grid, not according to their perception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks, if the learner's response is not rewardable according to the marking grid.
- Where judgement is required, a marking grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The marking grids have been designed to assess learner work holistically. Rows in the grids identify the assessment focus/outcome being targeted. When using a marking grid, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner's response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer, in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band, depending on how they have evidenced each of the descriptor bullet points.

Question Number	Answer	Mark
1ai)	<p>Award one mark for any of the following up to a maximum of two marks:</p> <ul style="list-style-type: none"> • beak quality • eyes • feather colour • limbs • feet/claws • cloaca • posture/conformation/meat yield • frequency of egg laying/egg production • incubation duration/requirements • behaviour assessment. • Temperament • health 	2

Question Number	Answer	Mark
1aii)	<p>Award one mark for the identification up to a total of two marks and one additional mark for each appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Hybrid vigour (1) reduces genetic faults (1). • As deleterious recessive genes will be masked (1) improving weight gain/egg laying/fertility (1). • Increasing the genetic pool (1) so animals are fit for purpose (1) <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
1b)	<p>Award one mark for the identification and one additional mark for an appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Isolated from other hens (1) to prevent bullying (1) • access to run twice daily (1) allow defaecation (1) • shavings/grass (1) to prevent damage to the chicks' feet (1) • Keep mother and chick together (1) to allow imprinting/learning (1) • Appropriate nesting material (1) for consistent temperature/hygiene (1) <p>Accept any other valid response.</p>	4

Question number	Indicative content	
1c	<p>Answers will be credited according to the learner's demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive.</p> <p>Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <p>Answers will consider all the factors that need to be covered when assessing livestock for their suitability including; animal's purpose, effectiveness in breeding, breed standards and meeting the aim of purchase.</p> <ul style="list-style-type: none"> • Factors affecting breeding considerations, e.g eyes, conformation, beak, egg laying performance, meat production, mothering/incubation behaviour, levels of aggression • Breed standards • Desirable characteristics • Assessment of breeding stock for suitability • Recommendations on suitability 	
<p>Mark scheme (award up to 12 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.</p>		
Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-4	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding. • presented in an unstructured format. • Limited reference to relevant evidence linked to the assessment. • A recommendation may be presented, but will lack focus and be superficial and underdeveloped.
Level	Mark	Descriptor
Level 2	5-8	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. • The answer is mostly supported through the application of relevant evidence drawn from the assessment and wider research. • Recommendation will be mostly focused and developed and show some linkages and lines of reasoning.
Level 3	9-12	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding. • presented in a clear and logical format. • Answer is fully supported throughout by sustained application of relevant evidence drawn directly from the assessment and wider independent research. • Recommendation will be clear, concise and well developed showing comprehensive linkages and lines of reasoning.

Question Number	Answer	Mark
2a	<p>1 mark for correct male genotype (1)</p> <p>1 mark for correct female genotype (1)</p> <p>1 mark for correct male gametes (1)</p> <p>1 mark for correct female gametes (1)</p> <p>1 mark for each correct line (4)</p> <p>1 mark for correct probability (1)</p> <p>1 mark for correct identification of potential phenotypic probability (1)</p> <p>For a total of 8 marks.</p>	8

		Female gametes				
		RP	Rp	rP	rp	
Male gametes	RP	RRPP	RRPp	RrPP	RrPp	All walnut
	Rp	RRpP	RRpp	RrpP	Rrpp	2 walnut 2 Rose
	rP	rRPP	rRPp	rrPP	rrPp	2 Walnut 2 Pea
	rp	rRpP	rRpp	rrpP	rrpp	1 Walnut, 1 Rose, 1 Pea, 1 Single
Probability 9:3:3:1 walnut, rose, pea, single.						

Question Number	Answer	Mark
2b	<p>Award one mark for the identification and one additional mark for each appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Inbreeding means close relatives mating. (1) This leads to a reduction of genetic variation (1). • There is an increase in the number of homozygous alleles (1) leading to a reduction in health fitness (1) • More genetic diseases (1) causing a loss of money (1) • Increase in chance of mutation being expressed (1) leading to increase in genetic conditions (1) <p>Accept any other appropriate wording.</p> <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
2C	<p>Award one mark for identification and one additional mark for appropriate expansion to a total of six.</p> <ul style="list-style-type: none"> • Correct temperature (1) set 36°-40°/to match the body temperature of a mother hen (1). • Correct humidity (1) maintained at the start/increase at the end (1). • Eggs turned as necessary (1) prevents embryo adhering to the membranes (1). • Appropriate time 20 – 25 days (1) to allow couple development (1). <p>Accept any other relevant phrasing/wording.</p>	6

Question Number	Answer	Mark
3a	<p>Award one mark for identification and one additional mark for appropriate expansion to a total of four.</p> <ul style="list-style-type: none"> • Breeding plans record which pairs mate. (1) This can prevent in breeding/ensure outbreeding (1). • Production records identify egg laying/carcass weights of offspring/siblings (1) ensuring that high performing birds are used to breed (1). • Financial records identify sale price of identified lines (1) so birds carrying desirable traits are used for breeding (1). • Disease and treatment records identify the healthiest birds (1) so ensuring 'fittest' birds used for breeding (1). <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
3b	<p>Award one mark for the identification and one additional mark for each appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Correct training of staff (1) so they can apply the 5 needs/animal welfare act (1) list any of the 5 needs (1) to improve/maintain welfare/health (1). • Limits the mutilations allowed (1) such as beak trimming (1) allowing natural foraging as much as possible (1) whilst limiting the effects of bullying behaviour (1). • Limits stocking densities (1) reducing bullying behaviour (1) and reduces parasite problems (1) improving the general health of all the birds (1). <p>Accept any other valid response. Do not award more than one mark for listing the animal needs.</p>	4

Question Number	Answer	Mark
3c	<p>Award one mark for the identification and one additional mark for each appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Specific needs can be met (1) by isolating the animal (1). • Number of embryos present can be identified (1) nutritional needs can be met accordingly (1). • If conception is unsuccessful (1) another mating can be attempted (1) • Preparation for birth can be made(1)as dates can be estimated more accurately(1) • Once pregnancy is confirmed appropriate monitoring can be put in place (1) so problems/issues can be identified (1) <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
4a	<p>Award one mark for the identification and one additional mark for each appropriate expansion to a maximum of four marks.</p> <ul style="list-style-type: none"> • Identification/isolation (1) so the desired trait/genetic material is inserted (1). • Amplification (1) so that there is enough genetic material to ensure success (1). • Association with promoter (1) so that the material can be inserted successfully (1). • Multiplication (1) so enough plasmids to allow successful transfer (1). • Transference (1) so it is integrated in recipient genome (1). <p>Accept any other valid response.</p>	4

Question Number	Answer	Mark
4b	<p>Award one mark for identification and one additional mark for appropriate expansion to a total of six.</p> <ul style="list-style-type: none"> • Point mutation (1) where the individual base has been changed, e.g adenine to cytosine (1). • Insertion (1) where a length of DNA has been inserted into a gene (1). • Deletion (1) where a section of DNA has been lost from a gene (1). • Duplication (1) where a length of DNA has been copied several times (1). • Translocation (1) where a length of DNA has been moved from one chromosome to another (1). <p>Accept any other valid response.</p>	6

Question Number	Indicative content
4 (c)	<p>Answers will be credited according to the learner's demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <ul style="list-style-type: none"> • Identifies genetic defects before they cause a problem • Prevents carriers passing deleterious genes on • Can reduce problems where there is a limited gene pool • Costly procedure for relatively low value animals • Disruptive procedure for animals that do not respond well to handling • Potential for causing miscarriages

Mark scheme (Award up to 6 marks) Refer to the guidance on the cover of this document for how to apply Levels Based Mark Schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. • Generic statements may be presented rather than linkages being made so that lines of reasoning are unclear or rarely supported through the application of relevant evidence from the context. • Displays a limited awareness of benefits or drawbacks leading to an evaluation that is superficial, focuses on only one element and therefore judgement is limited.
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. • Some occasional linkages present so that lines of reasoning are mostly clear and partially supported through the application of relevant evidence from the context. • Displays an awareness of both benefits and drawbacks leading to an evaluation although there is an imbalance with one element more heavily present therefore judgement is partially developed.
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. • Comprehensive linkages evidenced so that lines of reasoning are clear and concise and well supported throughout by sustained application of relevant evidence from the context. • Displays a thorough awareness of both benefits and drawbacks leading to a well-balanced evaluation therefore judgement is well developed.

Question number	Indicative content	
4d	<p>Answers will be credited according to the learner’s demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <ul style="list-style-type: none"> • Positive effect on health of humans eg utilitarian, deontological, consequential • Unforeseen consequences of moving genes across species • Possibility of escape into wider gene pool • Unforeseen effects • Efficient production of molecules that are difficult to synthesise • Regulatory bodies eg. DEFRA • Potential welfare needs and issues 	
<p>Mark scheme (award up to 12 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.</p>		
Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–4	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. • Generic statements may be presented rather than linkages being made so that lines of reasoning are unclear. • Discussion is superficial rarely supported through the application of relevant evidence from the context.
Level 2	5–8	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. • Some occasional linkages present so that lines of reasoning are partially supported and mostly clear. • Discussion is partially developed occasionally supported through the application of relevant evidence from the context.
Level 3	9–12	<ul style="list-style-type: none"> • Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. • Comprehensive linkages evidenced so that lines of reasoning are well supported, clear and concise. • Displays a well-developed and logical discussion supported throughout by sustained application of relevant evidence from the context.

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