

Level 3 Lead Examiner Report 1906

June 2019

**Level 3 National in Animal
Management**

***Unit 1: Animal Breeding and
Genetics (31644H)***

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A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit and Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

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Animal Breeding and Management

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	12	24	41	58

Introduction

This is the third time this externally assessed unit has been examined. The context of the task element of the paper was breeding rabbits.

The higher achieving learners applied the information they had researched to the scenario in the paper very well and produced some very pleasing answers. Some of the lower achieving learners appeared to either struggle to apply the information they had researched to the scenario, or had not taken suitable notes in with them. Many of the lower achieving learners had not taken the instruction in the question to make a recommendation of the potential breeds the breeder could use into account, so had not been able to access the higher marks.

Many learners found the genetics section of the paper difficult, even though this is in every paper available for centres to use with their learners.

Introduction to the Overall Performance of the Unit

Overall the paper well, with a pleasing performance at the distinction grade. There was a better performance generally on the questions that were about the practical aspects of breeding as learners seem to find them accessible whereas they appeared to struggle on the more theoretical aspects of genetics.

Individual Questions

1(a) Good Response

Two correct reasons are stated, although the learner has written more than is necessary for a 'state' question and learners should be encouraged not to spend excessive time on these questions.

1 (a) State **two** reasons why you should provide breeding females with a nesting box. (2) Q01a

- 1 Provides her with a place to build a nest which is a natural behaviour before parturition.
- 2 It is more hygienic to provide a separate birthing area to the toileting area, and more private for birthing too.

Poor Response

The learner has been credited for keeping the kits safe, although the rest of the answer is too generic. Learners should limit their answer to single points when answering 'state' questions. One mark gained.

- 1 So that they can start to nest whenever they need to, it is a sign that the rabbit may be pregnant.
- 2 So that they can feel comfortable during pregnancy and they know they have a safe place for the baby rabbits when they are born.

1(b) Good Response

Two correct descriptive points are made.

(b) Describe the correct handling technique for lifting a rabbit.

(2) Q01b

Hold the rabbit gently but firmly, ensuring one hand supports the back and hindquarters at all times i.e. scooping the rabbit up. Having all feet against your body helps the rabbit feel more secure, especially pregnant does.

Poor Response

This response is incorrect in parts, and unclear what the learner actually means in others. Learners should be encouraged to match the short answer questions to the number of marks available. No marks gained.

(b) Describe the correct handling technique for lifting a rabbit.

(2) Q01b

When lifting up the rabbit for handling, you first lift it up by its chest with two hands, then bring up to chest height and keep one hand on the chest and the other arm/hand around the rabbit to secure it.

1 (c) Good Response

Two reasons are identified then expanded as are required by the command term 'explain'. This response gained four marks.

(c) Explain **two** reasons why you should always take the female to the male when mating rabbits. (4) **4** Q01c

1 female rabbits can be extremely territorial ~~by~~ over their ~~to~~ space - by putting the female in with the male

2 Helps the buck to focus on the job at hand. In a new environment they may get distracted and the breeding process unsuccessful. (Total for Question 1 = 8 marks) **7**

It reduces the risk of aggression between the two rabbits

Poor Response

The response incorrectly identifies two reasons the doe should be taken to the buck and not the other way around. No marks gained.

(c) Explain **two** reasons why you should always take the female to the male when mating rabbits. (4) **0** Q01c

1 so you can remove the female easily if they don't get on

2 so the female can choose ~~her~~ her mate

2(a) Response

Four correct characteristics are given, personality was accepted as a euphemism for temperament. Very few poor responses were seen for this question, where they were the learners had repeated characteristics in slightly different terms, e.g. personality, temperament, docility etc.

- 2 (a) Give **four** characteristics you would consider when choosing rabbits to breed from.

(4) 4 Q02a

- 1 ~~Age span - a longer healthy lifespan is desired~~
personal health - have they had any health issues
- 2 fur type - including length, colour, thickness
is it desired by the buyer
- 3 hereditary disease - will offspring be likely to
be healthy or not
- 4 personality - a docile nature is preferred and
will likely be passed on

2(b) Good Response

This response demonstrates accurate knowledge and the learner has presented their understanding clearly and logically. The relevant evidence from the learner's research has been applied and a clear recommendation given as required in the question. A more detailed justification of why some breeds had been rejected would have improved the answer further. This response gained 12 out of 12 marks.

(b) Discuss factors and options Gemma should consider to achieve her aims, taking into account the desirable characteristics of the chosen breed.

Use your research notes to help you make a recommendation.

→ Size
 Sociability
 Genetics
 Health
 Coat
 Colouring (12) 1202b

The business is based in a small shed therefore the size of the rabbits should be considered. Larger breeds of Flemish and Continental Giants would be unsuitable because the environment is not suitable for them, so a desirable characteristic would be a smaller rabbit breed e.g. Netherland Dwarf.

The rabbits will be sold as pets. Smaller rabbits are more popular because of their "cuteness" factor and they require less space. They are easier for children to interact with and friendlier than larger breeds. This "cuteness" is a suitable characteristic and desirable because it will make it easier for Gemma to sell the rabbits. However, whilst small breeds are considered cute they often have longer coats that require maintenance and can cause health problems e.g. overheating in summer. This will make it harder to breed the rabbits and care for their health. Because they are pets and not 'show' rabbits, these long coats are not a necessary or desirable characteristic.

Gemma has close neighbours on both sides. A desirable characteristic would be to have more sociable and less highly strung rabbits that can cope with loud noise and

travelling to a pet shop easier than higher strung breeds.

White rabbits or red-eyed are not a desirable characteristic because they remind buyers of laboratory rabbits. This will put buyers off and be bad for business. An option would be to breed more common colours e.g. black, brown, or red. Gemma should consider genetically screening her rabbits before breeding to check their health e.g. cloudy cornea.

Overall, Gemma should breed a small, healthy, common-coloured, short-haired, friendly rabbit. Recommendations are Holland Lop, English Lop, and the Dutch Rabbit, instead of Giants or long-haired Lionhead Rabbits

(Total for Question 2 = 16 marks) **15**

Poor Response

The learner has described some considerations to be taken into account when breeding rabbits such as space, hutches etc, but they have not made a recommendation as to which breed should be chosen. This is required in the question. This response gained three out of 12 marks.

(b) Discuss factors and options Gemma should consider to achieve her aims, taking into account the desirable characteristics of the chosen breed.

Use your research notes to help you make a recommendation.

(12) ³ Q02b

The first thing Gemma needs to take into account is housing requirements. Rabbits prefer to ~~live~~ ^{live} with other rabbits but the hutch should not be overcrowded. Whilst breeding rabbits should be on their own and they need extra space to nest when pregnant. The hutches should also have protection from the weather as pregnant rabbits and newborns are extremely vulnerable. This is maybe where the garden shed would be useful.

Gemma will need to ensure that there isn't going to be any major disruption from her neighbours which could frighten the newborns, make them nervous long term which isn't a desirable trait in a pet.

Gemma should also make sure she chooses the right ~~breed~~ rabbits to breed. Their parents should have

a good fertility history, good health and good appearance.

3(a) Good Response

The learner has accurately applies their knowledge of dihybrid crosses to the information provided and calculated the phenotypic probabilities from the possible genotypes formed. This response gained 8 out of 8 marks.

3 When Gemma is looking at the different breeds of rabbits she realises that the same breed of rabbit can come in various colours and sizes. Male Female
 Colour and size are controlled by the rabbit's genetics. bbDd BbDd
 The gene for colour has two alleles. bD bd bD bd
 The allele for black colouring is B and is dominant. bD bD
 The allele for brown colouring is b and is recessive. bd bd
 The gene for size has two alleles. BD Bd bD bd
 D is for dwarfism and shows incomplete dominance, which means that a rabbit with:
 dd is homozygous recessive and is normal sized.
 Dd is heterozygous and is dwarf sized.
 DD is homozygous dominant and is a 'peanut', these are stillborn.

Gemma mates a male dwarf brown rabbit with a female dwarf black rabbit, she knows the dwarf black rabbit is heterozygous for coat colour.

(a) Calculate the phenotypic probabilities of the offspring using the dihybrid template.

(8) 8 Q03a

$BbDd$ \times $bBdD$		Male $bbDd$			
		bD	bd	bD	bd
Female $BbDd$	BD	$BbDD$	$BbDd$	$BbDD$	$BbDd$
	Bd	$BbDd$	$Bbdd$	$BbDd$	$Bbdd$
	bD	$bbDD$	$bbDd$	$bbDD$	$bbDd$
	bd	$bbDd$	$bbdd$	$bbDd$	$bbdd$

Phenotypic probability		Black Peanut	2:16
$BbDd$	2	Brown Normal	2:16
$bbdd$	2	Brown Dwarf	4:16
$bbDd$	4	Black Dwarf	4:16

3(b) Good Response

One way is identified and expanded accurately. Linking the care to the date of parturition would have improved the answer, e.g. provide privacy as the date nears. This response gained three marks.

It ensures that you know the date of conception. This means that you can provide the animal with the appropriate care + nutrition she needs. It also helps you to estimate ~~a day~~ the day of parturition.

Poor Response

The identifications made are accurate for general husbandry, they are not particular to a breeding programme. Keeping records on paper is irrelevant to the context of the question. This response gained no marks.

(b) Explain **one** way record keeping is used when running a breeding programme. (4) 0 Q03b

record keeping is used to keep track of healthcare, number of offspring, death etc. It can be done on paper and then all of the paper is put into a folder and filed away. keeping records on paper can be good as you can organise the information and use it easily / easy to read or understand.

4(a) Good Response

Three points are accurately identified and expanded as required by an explain question. This response gained six marks.

1 The doe may get a lit stuck which could lead to ~~death~~ death of the mother + litters if left untreated

2 Young or inexperienced does may kill and eat their young - this is a natural, nest clearing instinct which can occur if they are ~~are~~ nervous or scared.

3 ~~When pregnant the doe may experience~~ ~~weight swing~~ making her hard to handle + ~~move~~. This can continue after birth which makes it hard to check on the litters

Can abort or resorb fetuses due to nutritional deficiencies or disease.

Poor Response

Three points are made but they are not relevant to the care of newborn kits or actions the breeder should take. No marks gained for this response.

1. Some kits are born and they possess no growth hormone, which makes their survival impossible.
2. If a nest box has rough edges like splintering wood, then this could contribute to the doe or a kit getting mastitis, which is a bacterial infection of the mammary glands and the offspring may ^{be} too weak to fight off the infection. Decreasing their survival chance.
3. Does may kill their young because of neglect or nervousness.

4(b) Good Response

Three points are accurately identified and expanded as required by the command term 'explain'. The first two points are not on the mark scheme but were awarded under 'accept any other valid response' as they were not responses commonly seen and were worded in a different way to how other learners had but they were valid responses. This response gained six marks.

Gemma wants to maintain high standards of husbandry for her newborn rabbits.

(b) Explain **three** actions Gemma should take.

(6) Q04b

1. ~~The rabbit should not be kept in a cage~~ ensure gloves which are scented like the mother are used when checking on kits & do not move things, if needed replace properly otherwise mother can reject / eat her young if she feels they have been tampered with
2. Ensure mother is kept away from other rabbits to minimise stress and give privacy, if she believes others can see her she may not feed her young or not to reveal their location to possible predators
3. Ensure mother's nutritional needs are met, if nutrient deficient her milk may not be able to sustain her young and the kits may die

Poor Response

The points identified in this response are inaccurate as they refer to rabbits in general, or older kits. The question refers to newborn rabbits specifically and the learner has not addressed this. This response gained no marks.

1 Feed the kits high quality food, specific for young rabbits and Comfrey leaves should be added to prevent dehydration.

2 rabbits are sensitive to heat so their hutches should be ventilated and should be shaded to prevent rabbits from overheating, which could cause many health problems.

3 Provide chews + toys as the rabbits grow, to grind their teeth down as their teeth are constantly growing and could cause infections and health issues, if they become ingrown.

4(c) Good Response

The learner has identified that the type and amount of feed needs to included in the care plan. This response gained two marks.

(c) Explain **one** thing you would have to include in your care plan when hand rearing a rabbit. lared w

(2) Q04c

Amount of feed - colostrum replacement. How often/
 how much to give to ensure they're not eating
 too much / too little. Hygiene - cleaning feeding
 bottles to prevent illness/disease.
 Temperature (to regulate kit temp). (Total for Question 4 = 14 marks) **11**
 to prevent death.

Poor Response

The learner has made a point about the possible food but has not expanded this to detail either how often or how much to give the kit. One mark gained for this response.

The rabbits should be fed kitten milk replacer or
 a formula of half a cup of evaporated milk, half
 a cup of water, 1 egg yolk and 1 tablespoon of corn
 syrup. Also rubbing kits with a towel ^{will} ~~with~~ encourage +
 the kits to breath. (Total for Question 4 = 14 marks) **4** stimulate

5(a) Good Response

Two relevant technologies as listed in section C1 of the specification are identified and accurately expanded. Four marks gained for this response.

- 1 the use of artificial insemination can be used to diversify a breeds gene pool and potentially avoid the passing on of genetic hereditary conditions.
- 2 the use of ultrasound scans allow for accurate prediction of litter size ~~as well~~ which allows for better preparation to be in place for the kits' birth.

Poor Response

IVF has been identified but this is used when there are reproductive issues, not to improve breeding success. The second identification has not been addressed. This response gained no marks.

- (4) U Q05a
- 1 IVF as the sperm is ~~af~~ injected into the females womb to increase chances of fertilisation and without risking a male and female from fighting as they don't have to make contact with ^{each} other.

5(b) Good Response

The effect of gene mutation on the evolution of variation rate is section C4 of the specification. This learner understood that a good mutation will increase the variation as it is selected for whereas a poor mutation can have no or a negative effect. Four marks gained for this response.

The effects of genetic mutation on variation in a species depends whether the genetic mutation is useful or not. If the genetic mutation results in an undesirable trait to survival, it is likely the animal won't last or be bred from meaning variation is unchanged. If the trait is desirable, the opposite will happen and people will try to breed the animal with that mutation creating more of them.

Poor Response

Although the learner understood that mutation can change an animal's phenotype, there is no link to the effect on variation. This response gained one mark.

genetic mutations can cause an animal to have different coat colours e.g. white tigers and can cause an animal to have different markings. Genetic mutations can cause different behaviours in an animal

5 (c) Good Response

Two gene interactions are identified and a further descriptive point made. These are taken from section C3 of the specification. This response gained four marks.

(c) Describe **two** ways genes may interact.

(4) Q05c

1 incomplete dominance = alleles interact to create a new phenotype in the animal

2 lethal alleles = recessive genes, if an animal has two recessive alleles of this type it will be stillborn

Poor Response

The learner seems unfamiliar with the term gene interactions although it is referenced directly in the specification. The have basically described the role of genes. No mark gained for this response.

1 genes can be passed down from parents to offspring which could ~~mean that~~ determine whether the offspring have a disease or what colour eyes they have.

6 (a) Good Response

This learner has discussed the use of inbreeding to select for specific desirable traits and then discussed the dangers of this and suggested ways breeders could avoid the worst problems associated with inbreeding. This is a levelled question and the answer demonstrates the qualities required in a level 3 answer.

6 (a) Discuss the use of inbreeding when constructing a mating scheme.

(6) 6 Q06a

Inbreeding may be used in mating schemes to ensure that a specific desirable gene for a desired trait is passed onto the offspring. This is called positive assortative mating, breeding animals with similar characteristics. This ensures that the trait is passed on for the breeders, inbreeding can also pose ethical issues as there's a higher chance for genetic disorders to be passed on. These are caused by a reduction in the gene pool reducing variation and increasing homozygous recessive disorders to occur or 'inbreeding depression'. Mating scheme should therefore attempt to out-breed these disorders through negative assortative mating to improve the health and welfare of the breed in future generations.

Poor Response

The learner has made an isolated point about desirable characteristics but has not gone on to discuss it in any meaningful way. A level 1 answer.

6 (a) Discuss the use of inbreeding when constructing a mating scheme.

(6) 1 Q06a

Inbreeding can increase the chances of the offspring having desirable characteristics, meaning that more people will buy them as they are desirable.

6(b) Good Response

This is a levelled discuss question for 12 marks. The learner has discussed the question in the context of rabbits although this was not actually required in the question. The knowledge and understanding demonstrated is accurate, and the points made are relevant. These are put into a well developed and logical discussion.

When breeders select animals such as rabbits for a breeding programme they choose the animals with 'desirable characteristics'.

(b) Discuss the ethical issues of breeding for 'desirable characteristics' in animals, such as rabbits.

(12) 1206b

Large rabbits were once in 'fashion' due to their large and different look & characteristics. Humans wanted these large house rabbits as pets - so more were bred. The trouble with these rabbits is that they have been genetically mutated and overbred to create this large look & docile nature - a large rabbit with large teeth & claws would not be quite as desirable. This example is unethical due to the rabbit being changed so much that it's unable to exhibit natural behaviour patterns - they don't live as long due to over sized hearts & kidneys to their health, they're more used to homes than outside. Another desirable characteristic is a pure white rabbit - Angora. This species breed were overbred for fur purposes with no care about the rabbit welfare needs. Without realising - most of these rabbits are blind & deaf because of a gene that has been unknowingly bred without care. These rabbits now suffer because of it (Albinos). The netherland dwarf has been bred for a smaller / flatter face and head for breed standard purposes. This causes them to be more susceptible to stress.

and fear as they are very small, their flat face has caused respiratory problems & suffering.

Breeding animals for specific characteristics can be unethical due to the lack of care on the genetic side of it. ~~For example~~ Meat rabbits are so big some of them can barely move - they are killed at 8 weeks when they're tiny. The breeder only cares about the income rather than the animal's health & welfare / suffering.

Outbreeding larger teeth of pet rabbits to prevent injury to humans causes ~~the~~ rabbits to not be able to chew / gnaw and eat / exhibit as they normally would - this is very unethical.

Show rabbits with larger ears are more susceptible to head tilt and other deep ear infections - but because humans think they're cute & will pay money for them, they are continued to breed.

Desirable characteristics will always sell well & make a profit regardless of the complications & health / welfare of the animal.

Rabbits can be kept in unsuitable environments & be given traits that are not healthy or do not give them the best chance at life.

Poor Response

The learner has talked about the effects of breeding for desirable characteristics but these are not linked to the ethical considerations other than mentioning that they may not show natural behaviour but the point is not expanded.

The ethical issue is that certain breeds who are not desired or do not have desirable characteristics are not as wanted or they may get mistreated because they are not desirable. Another issue is that a desirable characteristic for a rabbit may not be a natural behaviour meaning that the need to be able to exhibit natural behaviours is not met as that natural behaviour may not be desirable.

Another issue is that some rabbit breeds may become extinct as they are not desirable breeds so they won't be purchased as much as desirable breeds, decreasing their population as breeders will not choose to breed an undesirable breed because they will not sell for much money.

Summary

- learners should ensure that their notes are detailed and they are very familiar with them, as they will be using them in an exam situation.
- learners should use their notes and apply them to the scenario they are presented with
- learners should ensure they are familiar with the demands of the command terms used in this paper. These are detailed in the specification.
- In the short answer questions, especially those with the command terms give and state, learners should try to be succinct. Many learners write extensive answers to these, which takes time away from questions requiring a more extended response. Conversely many learners put single points in explain and describe questions where 2 or 4 marks are available.

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