

A Systematic Review Of Inherited Defects In A Selection Of UK Horse Breeds



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Introduction:

Inherited defects in breeds of domestic dog have been a recent focus of debate in the media, however the extent to which these occur in other domesticated species, such as the domestic horse (*Equus caballus*), has been largely overlooked. Practises associated with breeding for appearance in dogs, such as inbreeding and closed-stud systems, are found in horse breeding and thus we might expect to find similar trends in inherited defects.

We applied a systematic review to objectively examine breed differences in disease and injury in the domestic horse.

Methods:

AIM: To produce a comprehensive list of inherited traits in horses.

This poster will present results from horse breeds representative of the different types owned in the UK:

- Shetland and Fell Ponies
- Thoroughbred
- Arab
- Draft Horse breeds (e.g. Shire, Percheron and Clydesdale)

We used a two part search strategy: (1) electronic bibliographic databases for published studies; (2) reference lists of published studies, existing online databases of inherited traits in animals and relevant literature from equine and veterinary organisations.

Results:

There were a total of 58 disorders reportedly affecting the seven breeds of horse (see table 1). Two of these were considered to be linked with conformation, 16 were exacerbated by conformation and 40 were non-conformation linked.

Table 1. Number of associated disorders per breed and body system

	Total disorders	Behavioural	Cardiovascular	Gastrointestinal	Immune	Integument	Musculoskeletal	Nervous/sensory	Urogenital
Shetland Pony	4	0	0	0	0	1	1	1	1
Fell Pony	3	0	0	0	2	0	1	0	0
Thoroughbred	25	5	4	2	3	0	7	1	3
Arab	20	2	1	4	2	1	4	4	2
Shire	6	0	0	0	0	2	3	0	1
Percheron	4	0	0	0	0	0	3	1	0
Clydesdale	6	0	0	0	0	1	3	1	1

Table 2. Breed features that were examined for relations with the number of disorders

	Size Classification	Size (hands)	Purpose	Popularity	Number of papers
Shetland Pony	Pony	<10.2	Riding / driving / competition (drive)	20	6
Fell Pony	Pony	<14	Riding / competition (End, drive)	27	11
Thoroughbred	Medium	15.2 - 17	Riding, racing (flat, steeple), competition (D, S), event)	5	42
Arab	Light	14.2 - 15	Riding / competition (End)	1	43
Shire	Heavy	<17	Work (draft) / competition (show)	37	7
Percheron	Heavy	16.2 - 17.3	Work (draft) / competition (show, drive)	*	5
Clydesdale	Heavy	16.2 - 18	Work (farm / mining) / competition (show)	22	7

None of the features in table 2 affected the total number of disorders that a breed was associated with. However, there were trends (e.g. more popular breeds had more disorders).

Discussion:

We found few cases where conformation directly resulted in defects. An example is osteoarthritis of the shoulder joint in Shetland Ponies due to the curvature of the joint being flatter and shallower. There were more cases of deleterious inherited traits, for example Severe Combined Immunodeficiency (SCID), a fatal disease of Arab foals causing a complete lack of antibody production and defective cell-mediated immunity. Interestingly, some behavioural traits such as the development of stereotypies have also been shown to have a genetic component in certain breeds e.g. Thoroughbred.

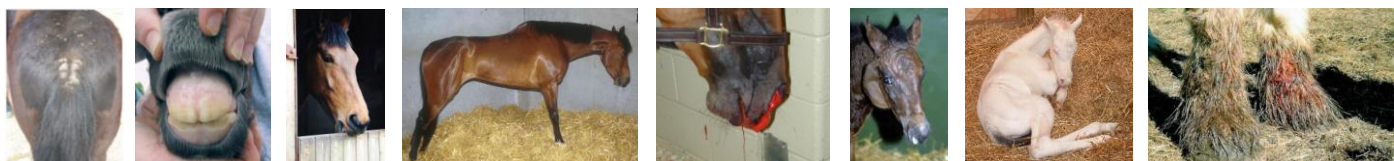
Many of the heritable defects encountered in these breeds have a simple inheritance pattern, and in several cases the gene responsible has been identified.

Continuing work:

This work is part of an ongoing study to examine breed differences in reported occurrences of disorders in the domestic horse.

When this data set is complete it is hoped that patterns between breed features and inherited disorders will be elucidated. The trends found in the seven breeds examined here is encouraging.

These results will be important to assess the impact that current breeding practices have on the welfare of domestic horses and to suggest targets for breeding programmes against inherited defects.



Further information:

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