DEFINITIONS FOR USE IN THE UK NATIONAL BREED INVENTORY AND FAQ
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Definition of a breed for the purpose of the UK National Breed Inventory

A livestock **breed**, in the UK context, is an interbreeding population of husbanded or formerly husbanded domesticated animals of consistent genotype and phenotype with a recognised history and administrative framework.

Eligibility of a "breed" for inclusion in the UK National Breed Inventory

To be included in the UK National Breed Inventory a breed should satisfy both of the following conditions:

- It fulfils, or potentially fulfils, a role in the rural economy. This condition may be satisfied by evidence that the breed has been, at some time in the past, viable in numbers that exceed criteria for being at risk by UN FAO standards.
- Less than 10% of the aggregate genetic contributions to the population over the last 4 generations are derived from other resources distinct from foreign herd books recognised as representing the same breed.

Definition of a "native breed"

For a breed to be considered **native**, the breed should satisfy all of the following criteria:

- The breed satisfies the criteria for inclusion in the UK National Breed Inventory described above.
- Breed history documents the breed origin within the UK (including from an amalgamation of native breeds) and the UK has formed the primary environment for the development of the breed.
- Breed history documents its presence in the UK in its current adapted form for a qualifying period of at least 40 years or 6 generations whichever is the longer period of time.
- Less than 10% of the aggregate genetic contributions to the population over the qualifying period are derived from other resources distinct from foreign herd books recognised as representing the same breed.
- A minimum of 80% of the genetic contributions from any generation of ancestors within the qualifying period must come from ancestors that were (i) registered in the breed's herd book and (ii) born in the UK. An exception to this may be granted as part of an approved conservation scheme. Henceforward, all conservation schemes that may threaten native status should be notified to Defra and the devolved administrations through the Expert Committee for prior approval.

Definition of "feral"

The following series of tests should be used to define **feral** FAnGR in the UK National Breed Inventory:

- the breed itself satisfies the criteria for inclusion in the UK National Breed Inventory as defined above; and
- the breed is not subject to routine handling of any kind; and
- more than 90% of the population have been born to feral parents, over two generations.

Definition of "exotic breed at risk"

An **exotic breed at risk** satisfies the following conditions:

- the breed is listed in the UK National Breed Inventory; and
- the breed does not qualify as a UK native breed; and
- the breed is considered to be "at risk" in a country where it is considered as native.

Definition of "Geographic concentration"

95% or more of the breed animal numbers are clustered within a 65km radius of the breed's mean geographic centre.

FAQ concerning wording of definitions

Q. What is a meant by a generation?
A. The time required to re-new the gene pool or, approximately, the average of the male and female generation intervals – where the male (female) generation interval is the average age of a male (female) parent when its replacement is born. Therefore the generation time varies with species: equines, typically 10 years; cattle, 6 years; goats, 3½ years; sheep, 3½ years; pigs, 2 years; and poultry, 1 year. These are the values which will be used by default unless there is clear documented evidence of a difference; which for example may occur with the use of a reproductive technology. These default values lead to the following qualifying periods for considerations of 'native': 60 years for equines; and 40 years for cattle, sheep, goats, pigs, and poultry.

Q. Why 10% and why 4 generations in the definition of "breed"?
A. Contributions to total gene pool are 50% from females and 50% from males. The level of 10% over 4 generations indicates a determined effort at breed formation over a prolonged period.

Q. Why does the definition of "breed" have the phrase "distinct from foreign herd books recognised as representing the same breed"?
A. A breed may import animals from abroad where the foreign herd book is recognised as representing the same breed. For example a UK-registered Jersey cow may be the offspring of a UK-registered Jersey cow and a Danish-registered Jersey bull. Nevertheless such gene flow may affect the native status of the breed as addressed below.

Q. Why does the definition and eligibility of "breed" differ from others bodies such as the RBST and FAO?
A. There are many definitions of the term breed and these differ according to the objectives of their originators. For the UK's National Breed Inventory it is necessary to have one which embodies the concept of a distinct gene pool and is objectively testable. It cannot rely on ideas of custom and tradition, nor can it be open to misinterpretation by others.

Q. Why does the qualifying period in the definition of "native breed" use the phrase "40 years or 6 generations, whichever is the longer period of time"?
A. This embodies the concept of continuous breed creation forming new breeds, representing a stable gene pool, and also embodies an idea of heritage in not only farm animal generations but human generations.

Q. Why must a breed that is considered "native" have a minimum of 80% of the genetic contributions from any generation of ancestors within the qualifying period come from ancestors that were (i) registered in the breed's herd book and (ii) born in the UK?

A. Contributions to the total gene pool are 50% from females and 50% from males. The value is not 100% as it permits managed contributions from other animals born outside the UK, or possibly from another breed, to assist in the development of the breed. Contributions from other breeds may often occur in the process of animals being graded up over the qualifying period. However the maximum level of 20% for other contributions ensures that this is managed as part of a sustained programme to develop or maintain the breed for the UK environment. Note that both the unmanaged use of animals from foreign herd books even if they are regarded as the same breed, and the unmanaged use of animals from other breeds, whether or not born in the UK, will threaten the designation of "native". In the latter case the listing of the breed in the UK National Breed Inventory may also be threatened depending on the extent of use (please refer to definition of 'breed').

Q. What is meant by **"**80% of the genetic contributions from any generation of ancestors within the qualifying period"?
A. This means that 80% of the genes in the current population must descend from parents of the same breed and born in the UK, and 80% of the genes in the current population must descend from ancestors two generations back that were of the same breed and born in the UK, and so on over the qualifying period. This places a continuous check on contributions and, for example, controls the use of animals that have been bred and selected abroad over several generations even though their earlier ancestors were born in the UK.

Q. In the definition of "native breed" aren't the two criteria concerning breed history equivalent?
A. Satisfying one may be instrumental in satisfying the other. One stresses the environment of formation, and the other emphasises continuity over time. For a breed imported into the UK from elsewhere, the date of breed origin as a native breed may be later than the earliest documentation of the breed.

Q. Why 90% and why two generations in the definition of "feral"?
A. Two generations ensures that the population has been through at least one cycle of being born to dams in feral conditions followed by growth, reproduction, and death as a feral animal. The 90% allows for an occasional release or escapee into the population.

Q. What is meant by "at risk" in the definition of "exotic breed at risk"?
A. The criteria for being considered "at risk" are defined by the country in which the breed is considered native.

Q. What are the meanings of the different categories "at risk" in the UK National Breed Inventory?
A. These criteria are defined in an additional document. Briefly the Inventory records the status according to different criteria to be used for prioritising actions. The sets of criteria listed are (i) those used by UN's FAO for global assessment of farm animal genetic resources, (ii) those defining qualification for special measures in the event of epidemics in the UK, and (iii) those defining qualification for financial support in agri-environment schemes.

FAQ on the interpretation and application of definitions

Q. Can a native breed become non-native?
A. Yes, when its management results in the breed failing to satisfy the criteria given above. Re-instatement of the breed as native requires the breed to satisfy all criteria in full. However considerations of "Original" populations are relevant to this issue.

Q. If a breed is a native in multiple countries, there is a possibility that the UK national sub-population will import genes from another national sub-population and hence destroy their native status. What happens?
A. Native status in the UK should be allowed to lapse as a default. However the UK may define whether the importation becomes recognised as an approved conservation scheme depending on the status on the breed.

Q. What if there has been importation from abroad sufficiently recently to undermine the prospect of native status for a breed, but this occurred before the current definitions were established?
A. It may be that this delays the breed becoming native if it has been done on a sufficiently large scale. However if it can be established that importation was undertaken as part of an approvable conservation scheme, then approval for the importation can be granted retrospectively. Henceforward all conservation schemes that may threaten native status should be notified to Defra and the devolved administrations through the Expert Committee for prior approval.

Q. How does a breed qualify for entry onto the list of breeds used for eligibility for potential financial support in UK agri-environment schemes?
A. Currently the breed must be (i) recognised as a UK native breed as defined above, (ii) established to be "at risk" in terms of the numerical scarcity thresholds set out in the appropriate European Union (EU) rural development regulations, and (iii) have pedigree registration procedures that are approved by Defra and the devolved administrations for the purposes of EU zootechnical regulations.

Q. What happens to "breed" and "native" status when a breed on the UK National Breed Inventory has a schism?
A. A schism occurs when a breed splits into two different parts, with each part derived from a single pre-schism breed listed on the UK National Breed Inventory. If a schism occurs, then each part of the breed must re-establish the criteria to qualify both as a distinct breed, and as a distinct native breed, starting from the date of the schism. However during the periods of qualification, the aggregate of the parts continue to qualify as representing the pre-schism breed, and if the pre-schism breed was native, the aggregate would continue to be designated as one native breed, assuming the aggregate continues to satisfy the requirements. When one of the parts qualifies as a native breed in its own right according to the definition above, then it is no longer considered as part of the aggregate pre-schism breed. The status of the other part would depend on its circumstances. The treatment of breed schisms is also relevant to considerations of "Original" populations.

Q. Is a cross between two native breeds, automatically a native breed?
A. No, the breed once formed is treated as any other. At first sight this may seem odd for a new breed formed by crossing two or more established native breeds. The reason is that, while the genes themselves might be considered "native" from the start, it still takes many generations of interbreeding and selection for the genome of the new breed (that is the 'package' of genes it represents) to become distinctively different from the parent "native" breeds and their first crosses. If one of the parent breeds were to become extinct in the UK or its gene pool severely depleted, then this may argue for an earlier designation of native.

Q. Does the UK National Breed Inventory recognise "Original" populations?
A. The justification for a designation of an "Original" population of a breed is the concern for an established native breed when the breed society manages the breed in a way that threatens the native status of that breed or, in more extreme cases, its status as a breed. This may arise when a breed undergoes significant introgression from animals of the same breed born outside the UK, or from animals of a different breed. The UK National Breed Inventory will recognise an "Original" population when a native breed undergoes

management that results in the loss of native status. In this event, a subset of the breed may be established as an “Original” population, *without* the need for any qualifying period providing the subset satisfies the other criteria for being designated a native breed. The status of the other component of the breed in the context of the Inventory is unlikely to be “native”.

Q. If a breed loses its native status due to introgression and an “Original” population is formed, what are the implications for gene flow between these sub populations?
A. The “non-Original” population may use animals from the “Original” population without threat to its status of breed in the UK National Breed Inventory. Likewise the “Original” population can use animals from the “non-Original” population, but this must be done with caution so as not to exceed the tolerance on the introgression of genes from outside the UK or from other breeds for maintaining native status.

Q. What feral populations exist in the UK?
A. The UK National Breed Inventory currently recognises only 4: the island populations of Soay and Boreray sheep, Chillingham cattle and Cheviot goats.

Q. Is all handling of feral populations forbidden if their status is to be retained?
A. The criterion states no routine handling, but it is accepted that there may be the occasional need to gather for the sole purpose of managing sustainable population numbers.

Q. What populations may be designated as feral in the future?
A. It is considered that a designation of feral may encourage abandonment or “re-wilding” of populations, and such practices have welfare implications for livestock. Therefore, no further populations are expected to be designated as feral. The existing feral populations are long-standing and viable.

Q. What is the purpose of the definition of “exotic breed at risk”?
A. The UK population represents an ex-situ population of the breed, and the UK may consider supporting conservation actions on behalf of the country in which the breed is considered native.

Q. What special considerations are given to island breeds in the UK National Breed Inventory?
A. If a native breed is associated with an island as its primary environment of development then all mainland populations can be viewed as ex-situ populations. However the aggregate of island and mainland are considered as forming the breed for the purposes of the definitions above. The balance between the in-situ island and ex-situ mainland populations at any time is nevertheless relevant to prioritising conservation actions, since the support of in-situ populations is given priority in the Convention on Biological Diversity. It is possible that, if there is little gene flow between the island and mainland populations over time, an *a priori* case may exist for the mainland population to be established as a breed and native breed in its own right. In these circumstances consideration of whether or not the mainland population qualifies as a separate breed should depend on the case made for fulfilling a novel role in the rural economy beyond acting as an ex-situ population for the island breed.