

# Definition of a breed for the purpose of the UK National 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.

Within a given breed it is not appropriate to split that breed on the basis of minor trait differences. Therefore, separate breed recognition will not be granted for sub-populations of the same breed where different phenotypes are attributable to a single or minor trait difference, e.g. different coat/fleece colours or patterns, polled vs. horned. It is a matter for individual breed societies to decide whether or not they wish to register such different phenotypes as separate sub-populations within their breeding book.

## Eligibility of a “breed” for inclusion in the UK National 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 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 40 years or 6 generations, whichever is the longer period of time.
- Not more than 20% of the genetic contributions come from animals born outside the UK (other than those imported for an approved conservation project) in any one generation for the last 40 years or 6 generations, whichever is the longer period of time.

## 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 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 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, 10 years; cattle, 6 years; goats, 3½ years; sheep, 3½ years; pigs and poultry, 2 years. 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. The default values lead to the following default total periods: equines, 100 years; cattle, 76 years; sheep and goats, 61 years; pigs and poultry, 52 years.

**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 other 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 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 misuse by others.

**Q.** Why 20% in the definition of “native” breed?

**A.** Contributions to total gene pool are 50% from females and 50% from males. The level of 20% represents managed contributions from outside that may have occurred over a long period, showing some degree of stability. It may have been necessary for greater contributions to manage a conservation scheme, so this ought to be recognised as a process that is underway. Note that this criterion concerns individuals born outside the UK, irrespective of whether or not they are considered to be of the same breed.

**Q.** Why 40 years or 6 generations, whichever is the longer period of time is the definition of “native breed”?

**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 genetic generations but human generations.

**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 a 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 born to dam 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 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 those used by UN’s FAO for global assessment of farm animal genetic resources, those defining qualification for special measures in the event of epidemics in the UK, and 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 project depending on the status on the breed.

**Q.** If importation from abroad into candidate breed for native status occurred sufficiently recently to undermine native status, and before the current definitions were established. What happens?

**A.** If it can be established that importation was undertaken as part of a conservation effort, then approval for the importation can be granted retrospectively.

**Q.** What qualifies a breed for financial support in agri-environment schemes?

**A.** Currently the breed must be (i) recognised as a native breed as defined above, (ii) established to be 'at risk' in terms of numerical thresholds set in the appropriate European regulations, (iii) pedigree registration procedures are approved by Defra 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 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.** Does the UK National Breed Inventory recognise 'Original' populations?

**A.** The justification for designating of an 'Original' population of a breed is the concern for an established native breed when the breed society manages the breed in such a way as to threaten 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 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 practice has 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 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 then 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.