

Important Points:-

1. Transgenic animals are animals that have had their DNA manipulated to possess and express an extra (foreign) gene. For example, transgenic mice, rats, rabbits, pigs, sheeps, cows and fish have been produced.

2. Common reasons for developing transgenic animals are:

(i) Study of normal physiology and development is carried out to understand gene regulation, their effect on the normal functions of the body and its development.

For example, study of complex growth factors like insulin, growth factor.

(ii) Study of diseases can be done by studying genes, which are responsible for causing diseases in human and their treatments.

For example, transgenic models have been developed for many diseases like cancer,

cystic fibrosis, Alzheimer's disease.

(iii) Biological products can be produced by introducing the portion of DNA, which codes for a particular product into transgenic animals.

For example,

(a) Human protein (a-1 antitrypsin) is used to treat emphysema.

(ii) The first transgenic cow in 1997, Rosie produced human protein enriched milk : (2.4 g/L). This milk contained the human a-lactalbumin and was more 'nutritionally balanced for human babies than natural cow milk.

(iv) Vaccine safety can be ensured by testing vaccines on transgenic mice before being used in humans, e.g. polio vaccine.

(v) Chemical safety testing known as toxicity/safety testing can be done in transgenic animals.

(a) These animals are made to carry genes, which make them more sensitive to the toxic substances than non-transgenic animals.

(b) When exposed to toxic substances, their effects are studied in a short time.