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Transgenic Animals

Animals that have had their DNA manipulated to possess and express a foreign gene are known as transgenic animals. Transgenic mice, rats, rabbits, pigs, sheep, cows and fish have been produced. Common reasons for development of transgenic animals-

- a) **Normal physiology and development**– they are designed to allow the study of gene regulation, their effect on normal function of body. By introducing genes from other species that alter the formation of this factor and studying the biological effects that results.
- b) **Study of disease**– a number of transgenic animals are designed to increase our understanding of how genes contribute to the development of disease. Transgenic model has been developed for disease like cancer, cystic fibrosis, Alzheimer's disease etc.
- c) **Biological products**– .Transgenic animals that produce useful biological products can be created by the introduction of the portion of DNA (gene) which codes for a particular product such as human protein (alpha – 1-antitrypsin) used to treat emphysema. The first transgenic cow, Rosie, produced human protein-enriched milk (alpha-lactalbumin – 2.4 gm / litre).
- d) **Vaccine safety**– transgenic mice are developed for used in testing the safety of vaccine before they are used on human. Polio vaccine was tested on transgenic mice and then on monkey.
- e) **Chemical safety testing**– transgenic animals are made that carry genes which make them more sensitive to toxic substances than non-transgenic animals. It gives us the results in less time.

Ethical Issues:

The Indian Government has set up organizations such as **GEAC (Genetic Engineering Approval Committee)**, which will make decisions regarding the validity of GM research and the safety of introducing GM-organisms for public services.

Biopatent:

A patent is the right granted by a government to an inventor to prevent others from making commercial use of his invention. Now, patents are granted for biological entities and for products derived from biological resources.

Biopiracy:

It is the term used to refer to the use of bio-resources by multinational companies and other organizations without proper authorization from the countries and people concerned without compensatory payment.

In 1997, an American company got patent rights on Basmati rice through the US Patent and Trademark Office. This allowed the company to sell a 'new variety of Basmati, in the US and abroad. This 'new' variety of Basmati had actually been derived from Indian

farmer's varieties. Indian Basmati was crossed with semi-dwarf varieties and claimed as an invention or a novelty.

Several attempts have also been made to patent uses, products and processes based on Indian traditional herbal medicines, e.g., turmeric and neem.