

Transgenic Animals & Ethical Issues

1 Mark Questions

1. Name the Indian variety of rice patented by an American company. [Delhi 2008]

Ans. Basmati rice is the Indian variety of rice patented by the US company.

2. What was the speciality of the milk produced by the transgenic cow Rosie? [All India 2008]

Ans. The transgenic cow, Rosie, produced human protein-enriched milk (2.4 gm/L). It contained the human α -lactalbumin and was nutritionally more balanced product for human babies than natural cow's milk.

3. A multinational company outside India tried to sell new varieties of turmeric without proper patent rights. What is such an act referred to? [All India 2008]

Ans. This is called biopiracy. It refers to the use of bio-resources by multinational companies and other organisation without proper authorisation from the countries and people concerned without any payment.

4. What does the organisation GEAC do? Check with reference to genetic engineering.[Foreign 2008; Delhi 2008C]

Ans. GEAC (Genetic Engineering Approval Committee) is an organisation set-up by the Indian Government to make decisions regarding the validity of GM research and the safety of introducing GM organisms for public services.

2 Marks Questions

5. What is biopiracy? State the initiative taken by the Indian Parliament against it. [Delhi 2014]

Ans. Biopiracy refers to the use of bio-resources by multinational companies and other organisations without proper authorisation from the concerned countries and people. The Indian Parliament has cleared a second Amendment of Indian Patents Bill as a initiative step against biopiracy. This bill consider issues including patent terms, emergency provisions as well as research and development initiative.

6. How have transgenic animals proved to be beneficial in
(i) production of biological products?
(ii) chemical safety testing? [Delhi 2014]

Ans. (i) The transgenic animals are proved to be beneficial in production of biological products like human protein α -1 antitrypsin (by coding genes for that protein only) in treatment of emphysema, and human protein (α -lactalbumin) enriched milk by transgenic cow, i.e. Rosie. This milk was more nutritionally balanced for human babies than natural cow milk. Transgenic animals are studied for testing toxicity of drugs and other chemicals, as they carry genes that makes them more sensitive to toxic substances.



7. How is 'Rosie' considered different from a normal cow? Explain.

[All India 2011; Foreign 2010]

Ans. The transgenic cow, Rosie, produced human protein-enriched milk (2.4 gm/L). It contained the human α -lactalbumin and was nutritionally more balanced product for human babies than natural cow's milk.

8. Biopiracy should be prevented. State why and how? [All India 2011]

Ans. Biopiracy should be prevented because

- (i) The countries and people concerned are not given adequate compensatory payment.
- (ii) The countries/people also lose their right to grow and use breeding experiments to improve the other varieties of the same species.

9. Describe the responsibility of GEAC, set-up by the Indian Government. [Delhi 2009]

Ans. GEAC (Genetic Engineering Approval Committee) is an organisation set-up by the Indian Government to make decisions regarding the validity of GM research and the safety of introducing GM organisms for public services.

5 Marks Question

10. What are transgenic animals? Explain any four ways in which such animals can be beneficial for humans. [Foreign 2008]

Ans. Animals that have had their DNA manipulated to possess and express an extra (foreign) gene are called transgenic animals. Transgenic rats, rabbits, pigs and cows have been produced.

Uses of transgenic animals for humans are:

- (i) To study gene regulation, their effect on the normal functions of the body and its development,
- (ii) Study of genes, which are responsible for diseases in human and their treatment, e.g. cancer,
- (iii) Useful biological products can be produced by introducing the portion of DNA, which codes for a particular product into transgenic animals.
- (iv) Transgenic mice are developed to test the safety of vaccines before being used in humans.

