

## Genetically modified animals and crops

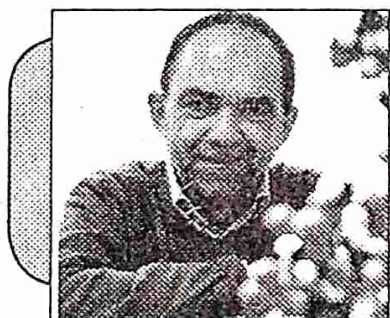
Many proteins that can be used for the treatment of diseases in humans are produced through genetic engineering.

Protein required for treatment	Disease/Symptom
Interferons	Viral diseases
Insulin	Diabetes
Endorphin	Pain
Somatotropin	Growth disorders

### What is meant by pharm animals? What is its advantage?

Genes responsible for the production of insulin and growth hormones required for humans are inserted into animals like cow, pig etc. These hormones are separated from milk or blood of these animals. It is very difficult to culture and maintain genetically modified bacteria. But it is easy to produce these products from pharm animals than from bacteria.

## DNA Finger Printing



Certain experiments conducted by the scientist Alec Jeffreys in 1984 paved the way for DNA testing.

### Indicators - Answers

- **Basis of the technology of DNA finger printing**  
Just like the difference in the finger print of each person, the arrangement of nucleotides in each person also differs. Examine the arrangement of nucleotides specific to each person is the basis of DNA finger printing.
- **Scope of DNA finger printing**  
Ascertaining disputed parentage, Identification of culprits, Identification of missing persons from their body parts etc.

**10. Name the scientist who invented the technique of DNA finger printing.** Alec Jeffreys.

**11. How do we make use of DNA finger printing in the detection of a crime?**

DNA extracted from the skin, hair, nail, blood, body fluids or other body parts obtained from the site of crime can be used to find out the culprit. This can be compared with the DNA of the suspected persons. Thus the real culprit can be identified from among the suspected persons through this method.

**12. How are relations identified through DNA testing?**

The arrangement of nucleotides in DNA shows most similarity among close relatives.

**13. What is DNA profiling?**

The arrangement of nucleotides in the DNA of each person differs. This finding leads to the DNA testing. The technology of testing the arrangement of nucleotides is called DNA profiling.

**14. Why do we call DNA profiling as DNA finger printing?**

Just as you find the difference in the finger print of each person, the arrangement of nucleotides in each person also differs. Hence this technology is also called DNA finger printing.

**15. Mention the ill-effects that happen due to the misuse of genetic engineering.**

- Genetically modified crops poses threat to indigenous varieties.

- Application of genetically modified pathogens in warfare can lead to disaster.
- Certain organizations argue that genetic modification is an intrusion upon the freedom of living beings and that it is a violation of rights.

**16. Since genetic engineering has many harmful effects, it can't be promoted. Do you agree with this statement? Why?**

Science and technology are the products of human thought. We can justify this only if they are utilised for human benefit. We must use science and technology to overcome the challenges faced by human beings. The decision to abandon genetic engineering is obsolete. It is only that we have to develop an attitude against misuse of genetic engineering through awareness programmes and workshops.

## LET US ASSESS - ANSWERS

1. d. X - ray defraction
2. (a) Gene therapy means the removal of the gene responsible for diseases and to insert functional gene in place of them. (b) Through gene mapping technology, we were able to identify the location of each gene in DNA that were responsible for a particular trait. This led to gene therapy. (c) We can control genetic diseases which were once incurable.
3. See answer to qn. no. 16