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Production of bovine chymosin using tobacco plants

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 Due to the development of modern biotechnology, we can change the genetic material in plants, animals, etc., in order to produce beneficial traits. So, manufacturing bovine chymosin using tobacco plants by altering their genetic material is one of the examples where modern biotechnology is in use. Chymosin enzyme is used in the manufacturing of cheese from curdled milk. Initially, chymosin was taken from the calf rumen, but due to the fact that calves had to be killed to extract the enzyme, there was a need for an alternative. In order to get a good cheese product, both the composition as well as chymosin play a very important role. Therefore, the gene named CYM (Cym-chymosin-Mus musculus), obtained from bovine, is expressed in the transgenic tobacco plant. Tobacco plants are mainly used as a model plant system for genetic transformation as their genomic mapping is almost complete. Additionally, they have a high survival rate, within the greenhouse as well as in in vitro conditions. Then, Southern blotting is carried out to see how the CYM gene has got integrated. This is followed by the polymerase chain reaction (PCR) to check for the process of transcription. Using plants to exhibit proteins is favoured over microbes as they are economical and safe to use. Hence, this kind of manufacturing process of the protease, chymosin, would be beneficial rather than extracting it from calf rumen, which is relatively more expensive.

Keywords: Chymosin, Tobacco plants, Southern blotting, Transcription, Genetic engineering

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