

Al-Farabi Kazakh National University (KazNU)

Faculty of Biology and Biotechnology



DISCIPLINE: «Modern Problems of Plant Genetics»

Lecture 13

Impact of Genetic engineering in agriculture: zero hunger, achieving food security and nutrition and promoting sustainable agriculture.

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* **Applications of Biotechnology in Food and Agriculture.**

- **Genetic modification of crops has substantially focused on improving traits for desirable outcomes. It has resulted in the development of crops with enhanced yields, quality, and tolerance to biotic and abiotic stresses. With the advent of introducing favorable traits into crops, biotechnology has created a path for the involvement of genetically modified (GM) crops into sustainable food production systems.**
- **Are Genetically Modified Crops the Answer to World Hunger?**
- **Hunger is a major world crisis for which a solution has not yet been found. Since their advent, genetically modified crops have been hailed as the key to solving world hunger.**

- * **The Future of Agriculture and Food: Sustainable Approaches to Achieve Zero Hunger.**
 - Established in 2015, the **United Nations Sustainable Development Goals (SDGs)** are a global call to action designed to eliminate poverty while protecting our planet to the 2030.
 - **(1)** The foundational SDG 2, **Zero Hunger**, aims to “End hunger, achieve food security and improved nutrition and promote sustainable agriculture.”
 - **(2)** In 2022, the American Chemical Society (ACS) initiated a new five-year project entitled the ACS Campaign for a **Sustainable Future Strategic Initiative**.
 - **(3)** highlighting the need for rapid innovation and the development of sustainable production methods.
 - **(4)** **Zero Hunger** should be a priority for governments with a focus on advancing science along with societal and economic development. In developing countries, the challenge is to ensure the stable food production from farm to table, while in many developed countries, the needs are related to healthier eating and reducing food waste.

* **The Future of Agriculture and Food: Sustainable Approaches to Achieve Zero Hunger.**

- **Despite progress, more than 790 million people worldwide still suffer from hunger.**
- **The fight against hunger has seen some progress over the past 15 years. Globally, the proportion of undernourished people declined from 15 per cent in 2000-2002 to 11 per cent in 2014-2016. However, more than 790 million people still lack regular access to adequate food. If current trends continue, the zero hunger target will be largely missed by 2030.**
- **Modern biotechnology provides a number of methods that scientists use to recognize and control the genetic structure of species for use in agricultural product development or processing.**
- **The implications of biotechnology includes, breeding of plants for raising and stabilizing yields by improving their ability to confront various pests, insects and other possible threats, to fight various conditions like drought and counter diseases that could attack and cold and soil acidity, biotechnology is also being applied for nutritional enhancement of various foods.**

* **Number and proportion of undernourished people, 2000–2002 and 2014–2016 (millions and percentage)**

Note: Vertical position of the bubbles represents the percentage of the population that is undernourished. The size of the bubbles represents the number of undernourished people. The proportion of undernourished people is less than 5 per cent for Northern Africa and Developed regions for both time periods.

