Exploring the composition of microbiota of stored grains using next generation DNA sequence technology

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Study the Genetics of Useful Characteristics of **Food Plants**



Integrated Research Approach:

- Molecular Genetics /Genomics
- Plant Breeding
- Plant Pathology
- Bioinformatics





Assist the Agri-sector to:

- Produce healthier & more food
- Manage their resources better
- Improve processing
- Reduce risk



Molecular Tools more accessible and cheaper



Microbiota: Microorganisms living in a specific environment i.e., *Aspergilli*



NGS utilizes DNA sequencing technologies that are capable of processing multiple DNA sequences in parallel



Metagenomics is the study of genetic material recovered directly from environmental samples



Assess the diversity and dynamics in food-based ecosystems



Identify high risk Microbiota and evaluate control measures

Metagenomics Sequencing







aacgtccaaaggagt gttacctacggctaa aacgtccaaaggagt ttcgagcatacgact cacgtcgaatgagt attacgtacgggtaa tacgtgcttacgagt tacgtgcttacgagt atcgaaggctagctat atcgaaggctagctat





Conventional quantitative culture dependent methods



- Biased towards the selective growth media used and fast-growing microorganisms
- Time-consuming and delay potential intervention
- High-throughput sequencing are now available and commonly used to assess the diversity and dynamics in food-based ecosystems





Potential Applications for grain storage



Identify high risk grains in field before harvest



Monitor and quantify development of the microbiota during storage



Measure effectiveness of integrated control measures



Identify resistance against control measures



Identify beneficial microorganism during storage



Reduce storage risk



