

## **Bioprocessing of agro-industrial residues into value-added functional and energy biomolecules**

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The agro-industrial activities generates residual biomass in huge quantity. This spare biomass not only generates environmental issues, but also results a loss in the bio-value present in the residual biomass. It is desirable to bioprocess this agri-waste to retrieve the maximum bio-value in the abundant residual biomass. Our group has developed bioprocesses to generate a stream of value-added products by transforming the low-value sugars into high-value functional biomolecules. The fruit and vegetable wastes can be treated with the biocatalysts which can transform the sugars like D-fructose into functional sugar of rare abundance in nature, such as D-allulose. Likewise, cane molasses is a by-product obtained in huge quantity during the production of table sugar. Molasses is rich in sucrose, which is considered of low-value. We have treated molasses with dextransucrase to transform sugars into prebiotic malto-glucooligosaccharides, and dextran. The D-fructose released as a by-product during this process was transformed into D-fructose by employing D-allulose 3-epimerase. These strategies are useful in transforming the fermentable sugars obtained from the abundant plant biomass in dual production of bioethanol, and value-added functional biomolecules, such as D-allulose. Thus, techno-economical bioprocesses should be developed for co-production of functional and energy biomolecules.