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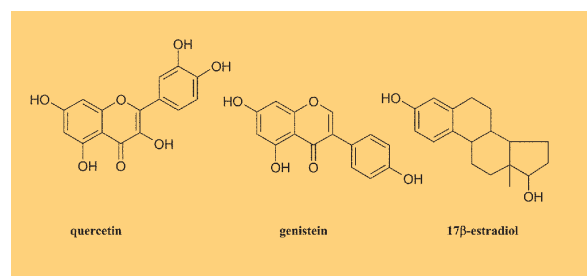
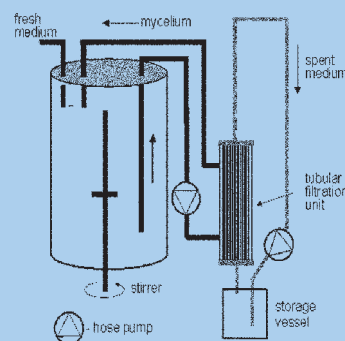
# Molecular Nutrition Food Research

## MNF Education:

### Scale-up of natural product formation and isolation

Ralf G. Berger, Thomas Scheper and Karl Schügerl

The industrial utilisation of the metabolic capacities of cells depends on the successful scaling-up of laboratory trials. The considerations usually start with the preparation of chemical elemental balances, or by monitoring and calculating the kinetics of growth. Input of mechanical energy and transfer of heat and of nutrients including oxygen are key to the process and differ among reactor types. The production of the character impact flavour compound 4-decanolide by the basidiomycetous fungus *Tyromyces sambucus* in a fed-batch stirred tank process is presented as a practical example of the scale-up of the production of a small, bioactive molecule. The scaling-up of a downstreaming process including some cost estimations is demonstrated using lactoferrin, a bioactive protein from whey. The concerted scale-up of a novel bioprocess is facilitated today by advanced bioreactor designs and downstreaming equipment, and by a set of proven strategies. However, specific properties of the microorganism, of the nutrient medium used, or of the product aimed at may rise unexpected problems. These can ultimately be tackled by experiments only. .... 732



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