

Selective removal of Flavour-active components



Project#: FO-10-05
Project Leader: Reinoud Noordman
E-mail: Reinoud.Noordman@Heineken.com
Partners: For phase 2, additional partners are welcome
Budget: to be determined for phase 2
Duration: Phase 1: 2009-2010; Phase 2: 2011-2015

Incentive:

Flavour control is a crucial element in food production processes. This requires extra process time, extra process steps and there are potential risks of product failure.

The ambition is to develop separation technology for downstream control of the flavour profile of food products. This would create more flexibility in the upstream process and provide opportunities on cost saving and/or product variation.

Objective:

Develop new technology for selective extraction of flavour-active components which:

- Is applicable to industrial production processes (10-100 m³/hr)
- Is cost efficient.
- removes components that are present in low concentrations (ppb-ppm level)
- Is selective in separating components that are not very specific in their molecular structure and properties
- Is food-grade

Target components beer	Typical beer composition	
Diacetyl (-)	Water	89%
Esters	Ethanol (mass)	6%
Alcohols (+,-)	Carbohydrates	4%
Aldehydes (-)	Proteins/ amino acids	0.5%
Sulphury components (-)	Organic volatiles	<0.05%
	Other	0.5%

- : off-flavour
+ : desired flavour

Approach:

The project is executed in 3 phases:

- Phase 1 (12 months), Pre-project: Experimental screening of new technologies.
- Phase 2 (3-4 years), Full project: Development of selected, most promising separation routes;
- Phase 3 (3-5 years), Industrialization of most promising industrial applications.

Phase 1, the pre-project, has been completed. The project is now in the full project definition phase (phase 2).

Results:

The pre-project showed the complementary potential of different technologies, such as stripping, ScCO₂ extraction, pervaporation and selective adsorption for selective removal of flavour active components from beer. Next step is to make process choices and develop the process for a specific case.

Future work:

A full project (phase 2) will be started up. For this part, co-operation with additional industrial is considered. Together with these new partners, industrial cases and the scope of the project will be redefined.