Xanthohumolextract

Xanthohumol is a hop polyphenol that has been found to have cancer-preventive potential in in-vitro tests [5, 6]. In contrast to other flavonoids, which accumulate in the leaves of the hop cone, xanthohumol is concentrated in the lupulin glands together with the hop resins. The content in cone hops can be up to 1%. When used as a food additive or for pharmaceutical products, a standardized concentrate should be used. The xanthohumol extract is produced from the hop dregs of the CO2 extraction by repeated CO2 extraction using higher pressures and temperatures.

Product Properties

Xanthohumol is soluble in ethanol, but not in supercritical CO2. Xanthohumol only dissolves in CO2 under increased extraction conditions (pressures up to 1000 bar and temperatures of 60-90°C). To avoid unwanted by-products, the spent grains are extracted again before the actual extraction (fractionating extraction). This produces a dry, solid, dark green powder with a xanthohumol content of up to 30% (higher concentrations can be achieved by further extraction adjustments). Only CO2 is used for the production, no additional additives are necessary. (Patents in this regard EU 1 424 385, registered in the USA and Canada 2004/0121040 A1 and Canada 2 451 46

Produkt Spezifications[1]

Description	dark green to yellow powder
Consistency	min. concentration 20% xanthohumol; 1-3 % isoxanthohumol
Solubility	completely soluble in pure ethanol up to 50g/100ml
Wöllmer fractionation according to EBC 7.6	Total resins approx. 90 % Soft resins approx. 25 % Hard resins approx. 65 %
α-acids	0,1 %
β-acids	0,1 %
Iso-α-acids:	< 0,1
Other ingredients	Semi-polar hop bitter substances (hard resins) such as hulupones or substances similar to humulinic acids approx. 3-5 % Traces of hydroxycinnamic acids, hydroxybenzoic acid and 8-prenylnaringenin (non-detectable are flavanols, proanthocyanidins, quercitin flavanoids, kaempherol flavanoids, among others)
Chlorophyll	1 -2 %
Heavy metals	in accordance with current EU and US legislation
Lead	in accordance with current EU and US legislation
Pesticides	in accordance with current EU and US legislation

Qualita Assurance and Food Safety

BarthHaas operates a quality management system based on ISO 9001 and food safety management programs in accordance with internationally recognized HACCP guidelines. Further information on our systems and programs can be found on our website (www.barthhaas.com).

Product Application

The xanthohumol extract described here is soluble in pure ethanol in concentrations of up to 50g/100ml and can therefore be dissolved in any beverage. Additions to soft drinks or juices can therefore be made without great difficulty. Depending on the concentration, a yellowish/green color may result.

In terms of brewing, xanthohumol-enriched extracts are the only way to bring the xanthohumol content of beer into a measurable range. Extensive research has been carried out to determine which factors influence the increased recovery of xanthohumol in beer [8]. The following points, referred to as "Xan technology", help to increase recovery rates.

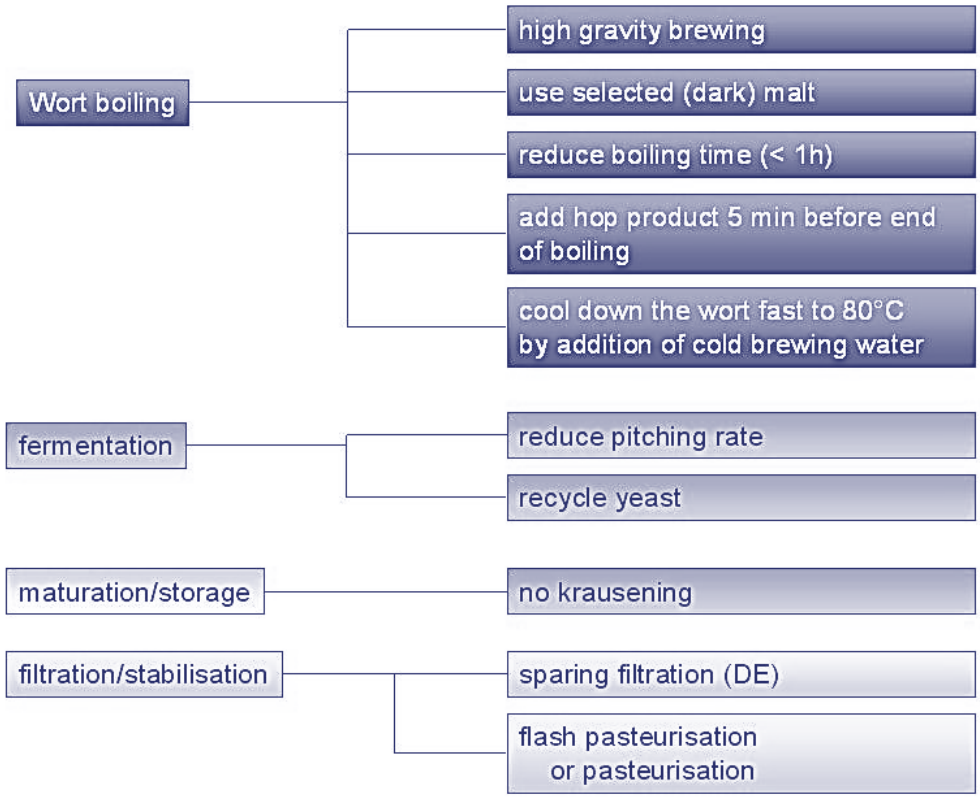

Fig.1: the "Xan" technology [source: Back et al. 2005 "Selected chapters in brewing technology"][1].

Xanthohumol rates in finished Beer

For unfiltered beers 1-3 mg/l

For filtered dark beers > 10 mg/l

To ensure the xanthohumol content in the finished product, the beer should be stored in a cool, dark place.

It is also possible to add the xanthohumol extract to the beer later in the brewing process, e.g. after maturation or before or after filtration, as described by Forster et al (2002)[4]. Particularly high xanthohumol recovery rates can be achieved by using dark malts (Walker et al.)[7]. Roasted malt beer mixed with xanthohumol extract is also suitable for this purpose. (Back, Xan II)[2]. Xanthohumol itself is tasteless. If xanthohumol is dosed together with alpha acids or dark malt, the resulting change in taste must be taken into account. In higher concentrations, the extract can change the fullness and mouthfeel of the beverage.

Calculations

The yields of xanthohumol extract vary greatly depending on the conditions in the brewery or brewhouse. Preliminary tests should therefore be carried out in the brewery to determine the specific yields. The dosage quantity results from the xanthohumol content of the extract. For initial trials on bottom-fermented beers, the dosage of xanthohumol should be about 30 times the amount you want in the finished beer, or 15-20 times for a dark beer. If the xanthohumol is added after filtration, you should work with 2-3 times the target concentration of xanthohumol.

Foam STability

Polyphenols have a positive effect on beer foam, so the addition of xanthohumol extract can also improve foam stability (Wilson et al) [3].

Light Stability

Xanthohumol extract is also suitable for the production of light-stable beers/beverages. However, this protection is only guaranteed if no other unreduced iso-alpha acids can get into the beer or beverage. Therefore, the bitterness of such beverages/beers, which are filled in clear glass or green glass bottles, must come exclusively from downstream products such as Tetrahop Gold👻 and or Redihop👻 or Hexahop Gold👻. Iso-alpha acid residues (e.g. from yeast) must also be excluded. If beta extracts are used, it must be ensured that the concentration of alpha acids or iso-alpha acids is below 0.2%.

Packaging

In 1 - 4 kg Cans

Storage and Shelf Life

The xanthohumol extract is stable for more than 12 months if stored in inert packaging and below 5°C/41°F.

Safety

All safety-relevant information can be found in the corresponding safety data sheet on the website (SDS).

Analyses methods

The xanthohumol concentration is measured by HPLC. Details on corresponding analyses on request.

Technical Consulting

We will be happy to provide you with advice and assistance on how best to use xanthohumol extract in beverage production.

E-mail us at: Brewingsolutions@barthhaas.de

Literary Sources

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