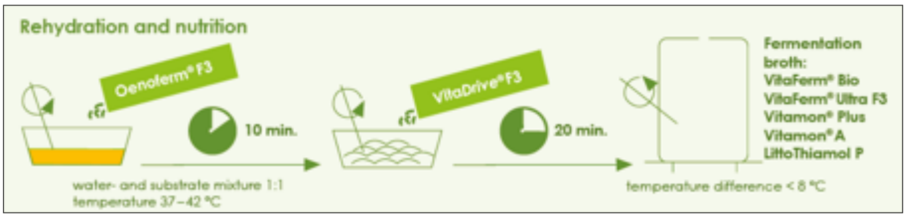
MORE THAN JUST A TREND?

Optimized production processes for the varieties of cider

For around ten years now cider, in all its different guises, has been firmly established. The various incarnations of cider have enabled this growth market to provide interesting, refreshing beverages for the consumer. Different demands are made of the production process depending on the type of cider and technology used.

For around ten years now cider, in all its different guises, has been firmly established. It was Ireland's Magners Cider which paved the way for the "cider wave." The dry, British working man's drink has become an off-dry, slightly sparkling beverage served over ice. Its light and refreshing style is especially popular with women and it established the current cider style which is popular the world over.

In the following years the Scandinavian breweries also turned their attention to cider and reinterpreted cider without having a domestic history of cider making. This resulted in the second cider wave – sweet, refreshing, often flavored beverages, which no longer have anything in common with the original style. Cider is still, however, based on fermented apple juice.



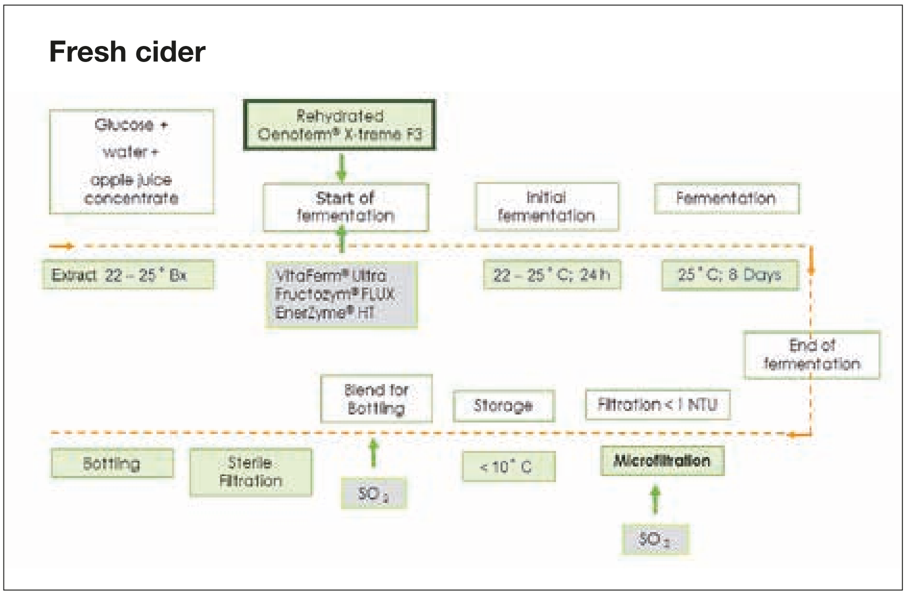
Rehydration and nutrition

From sweet to bittersweet

Whilst Scandinavia primarily ferments a mixture of apple juice and sugar, the majority of British ciders still contains a proportion of bittersweet juice. Bittersweet apples mainly occur in Brittany, Normandy and England (Herefordshire, Somerset) and have a high polyphenol content, coupled with low acidity. They are critical in determining the typical taste of a British cider.

Ciders only contain a proportion of bittersweet juice, because a pure bittersweet cider is too dry and has too strong an aftertaste for most consumers.

Unlike German "Apfelwein," or cider, to which only limited sugar can be added, British cider only has to have a fruit content of 35 percent.



Process of cider production (source: ©Erbsloeh)

ABV and the challenge of microbiological stability

According to British tax regulations, the ABV of cider must be between 1.2 and 8.5 percent. Generally, however, the aim is to achieve alcohol contents of 10 to 14 percent, which are then diluted and sweetened shortly before bottling.

The reason that producers try to achieve higher alcohol contents is because fruit wines that have an ABV below 10 percent have limited microbiological stability and suitability for storage. In order to minimize the risk of infection, cider is usually removed from the lees shortly after fermentation, a process which is carried out using crossflow filters (microfiltration).

Fermentation of Scandinavian-type cider, on the other hand, should be as neutral as possible. Commercial apple and pear juice concentrates are used for the base. These are fermented, together with sugar, to >12% ABV. The fruit content is much lower than in the British equivalent. This is due to the fact that the Scandinavians are striving for a beverage which tastes as little of fermentation as possible.

The cider is neutralized by treating it with a suitable typ of activated charcoal. The need for these ciders to be stabilized is also much higher. The "ciderbase" must have stable polyphenols and proteins because it is blended with various juices and flavorings. This is achieved by classic fining in conjunction with the activated charcoal. In this case, too, the cider is generally diluted and sweetened shortly before bottling.

Special attention must be paid to what are known as "wine faults." Microbiological infections repeatedly occur, especially when using fresh apple juice or concentrates that have not been stored in aseptic conditions. Lactobacillus and Brettanomyces yeasts are capable of forming what is known as "mousiness." This is caused by volatile phenols which develop aromas reminiscent of horse sweat and mouse urine and which are mainly detected retro-nasally [Lea].

Initial fermentation must be swift, followed by short, continuous fermentation to avoid the formation of such off flavors. Yeast strains Oenoferm® F3 and Oenoferm® X-treme come into their own here, with their fermentation kinetics.

Sulphurization and nutrition

Sulphurization should take place immediately after fermentation. In addition to choice of yeast strain, the supply of yeast during fermentation is very important for keeping the sulphur requirement as low as possible. Fewer fermentation by-products which bind to sulphur, such as acetaldehyde, will be formed, if the yeast has an adequate supply of vitamins and trace elements as well as nitrogen.

When fermenting ciders with low fruit contents, where the aim is higher alcohol contents, the yeast cell wall must be prepared at the rehydration stage to ensure optimum sugar-alcohol transportation into and out of the cell. This is achieved by adding yeast activator VitaDrive® F3 during rehydration. Complex nutrients such as VitaFerm® Ultra or Vitamon® Plus are then added to the must to ensure the yeast is fed.

Filtration

The introduction of crossflow filtration has increased processing speed and significantly reduced the frequency of microbiological infections during storage. Time and again there is significant loss of filtration performance that does not have a microbiological cause.

On the one hand this occurs when juices or concentrates are used in which the pectin or starch has not been sufficiently broken down. Where concentrates are concerned, however, there is also the possibility of retrograded starches (fragments of starches start forming starch chains again during storage).

In poor years juices also contain a smaller proportion of glucan, which forms a film on the membrane surface and makes filtration almost impossible.

A similar phenomenon can occur in ciders with a proportion of pear juice if there is an elevated araban content in the pear juice. Fermentation can be assisted by dosing with enzyme preparation Fructozym® Flux and glucoamylase EnerZyme® HT. The broad range of secondary activities in Fructozym® Flux (glucanase and hemicellulase) facilitates complete breakdown during fermentation. This prevents potential blockages or loss of filtration capacity from the outset. □

Reference:

Andrew G. H. Lea, John R. Pigott, Fermented Beverage Production, p. 59 to 84

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