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Functional food (functional fermented beverages and edible oils): when science meets bioeconomy and creates health lifestyle — Online Module
Functional fermented beverages – functional wines

Low-alcohol beverages from raspberries and blackberries – link between pleasure and health

Nowadays, berry fruits such as raspberries and blackberries are very popular due to the high amount of pigmented natural antioxidants which enables their classification as “superfood”. Furthermore, low level of sugars makes them suitable for fermentation and production of low-alcohol beverages.
Fermentation of raspberries is very interesting due to the significant content of ***anthocyanins***, especially **cyanidin-3-O-glucoside** and **pelargonidin-3-O-glucoside**, and ***phenolic acids*** such **chlorogenic acid**, **coumaric acid**, **ellagic acid**, **ferulic acid**, **syringic acid** and **gallic acid**, while **catechin** and **myricetin** are the most abundant **flavonoids** in raspberries [1]. Apart from anthocyanins, the raspberries are rich sources of **epicatechin**, **procyanidin B4**, **flavan-3-ol** trimers, **quercetin** and **quercetin-3-O-glucuronide**.



https://getbrewsy.com/blogs/recipes/raspberry-wine?srsltid=AU7gw4UvwykC7i5-LuunXobO65Dclb7Bc2mVix6eJXvHcyWSAtvSNNGh

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In comparison to red raspberries, the blackberries contain higher amounts of anthocyanins and other phenolic compounds. The most abundant **flavonoids**—such as **quercetin**, **kaempferol**, **luteolin-3-O-glucuronide**, and **apigenin-3-glucuronide** are presented in blackberries. Furthermore, from anthocyanins **cyanidin-3-O-glucoside** is the major compound that predominates among the bioactives found in *Rubus* fruits[3].



https://www.home-brew-hopshop.co.uk/blogs/home-brew-blog/blackberry-wine-sweet?srsltid=AU7gw4U1iRulNqhCz730bGiMmJZVG7RbWNYRg8Oh_RC92Dk-U9xcIlhz

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Taking into account the importance of raspberries and blackberries, their health-promoting effects and their potential for production of beverages rich in polyphenols, the main focus in this presentation is the production of **low-alcohol** beverages from these berries' growth in the Republic of North Macedonia.





https://www.hooky.co.uk/product/blackberry-wine-lyme-bay/?srsltid=AU7gw4XDrxqTmbRqg51CEZsArovBncKUPj7jgO0mqScWQCgIUIIlxf3n

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Usually, the so-called “fruit wines” available on the Macedonian market from berries are imported and always produced with the addition of sugar and an alcohol percentage between 10–13%, which makes them unsuitable for frequent consumption in larger quantities.
Due to the fact that alcohol strongly affects the sensory profile of alcohol beverages, the production of fermented berry beverages with a low percentage of alcohol (up to 4% which is necessary for the extraction of polyphenols and their bioactivity) and satisfactory sensory characteristics will be explain in this presentation [4].



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Berry fruits



Chokeberry fermentation



Yeast sedimentation in raspberry wine



Blackberry must



Raspberry must



Raspberry wine

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Generally speaking, low-alcohol berry beverages can be often favored by young and middle-aged consumers, especially young women. This can be concluded by the fact that the older population appreciates the well-known taste of grape wines [5].



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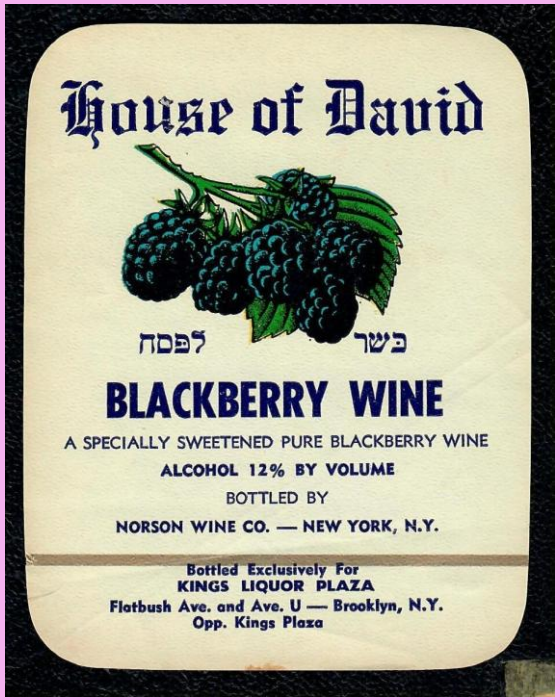
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The fermentation process and production of blackberry beverages usually involve **the addition of sugar to increase the percentage of ethanol**. For instance, traditional blackberry winemaking process included **a pre-fermentative stage where blackberries are mixed with approximately 20% raw brown sugar by blackberry weight** [6].

However, if we take into account the percentage of glucose and fructose in native blackberries and raspberries (less than 35 mg/100 g and 25 mg/100 g fruit, respectively), it is clear that ethanol measured in a blackberry beverage higher than 5% can yield this result by the addition of saccharose [6].



https://www.ebay.com/itm/175003862946

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HOW TO PRODUCE RASPBERRY AND BLACKBERRY WINE??!!

Step-by-Step Procedure

1. Prepare the Fruit:

• Freeze and thaw the raspberries beforehand to rupture the cell walls and release maximum juice and color, or mash them thoroughly in a straining/must bag.

2. Primary Fermentation Setup:

• Combine the mashed raspberries, dissolved sugar??!, water, acid blend, and potassium metabisulfite in a primary fermentation bucket.

3. Add Enzymes and Pitch Yeast:

• Add the pectic enzyme (wait roughly 12 hours after sulfites if required by your enzyme brand so they don't cancel each other out).

• After the full 24-hour sulfite window, add your rehydrated wine yeast and yeast nutrient.• Stir the must twice daily and keep the bag submerged



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Step-by-Step Procedure



4. Secondary Fermentation:

•When the specific gravity drops (around 8 °Brix or roughly 5–7 days of active primary fermentation), squeeze the excess juice from the fruit bag (stop the fermentation) and remove the solids.

• Transfere the liquid into a clean glass, leaving the heavy sediment (lees) behind, and attach an airlock.

•Allow secondary fermentation to finish over 2 to 3 weeks until the specific gravity reaches roughly 0.994–0.999.

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•Rack the wine away from the settled yeast layer into a fresh vessel.

•Stabilize with an additional potassium metabisulfite and a fining agent if you want to clear the haze.

•Allow it to condition and age in a cool, dark place, tasting to adjust sweetness or acid balance before bottling.

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THE SOUL OF SEOUL KOREA!



https://thesoulofseoul.net/meet-bokbunja-the-korean-black-raspberry-wine-that-broke-a-chamber-pot/

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https://fnhbev.com/products/gevorkian-365-blackberry-souvenir?srsltid=AU7gw4WiGIcSVsQAK0xAUq8ZA_xlegIxTsu2pBjJkoAEbtvfMiy9aaTn



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raspberry wines production - Google Search



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Questions and discussion please?!!



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