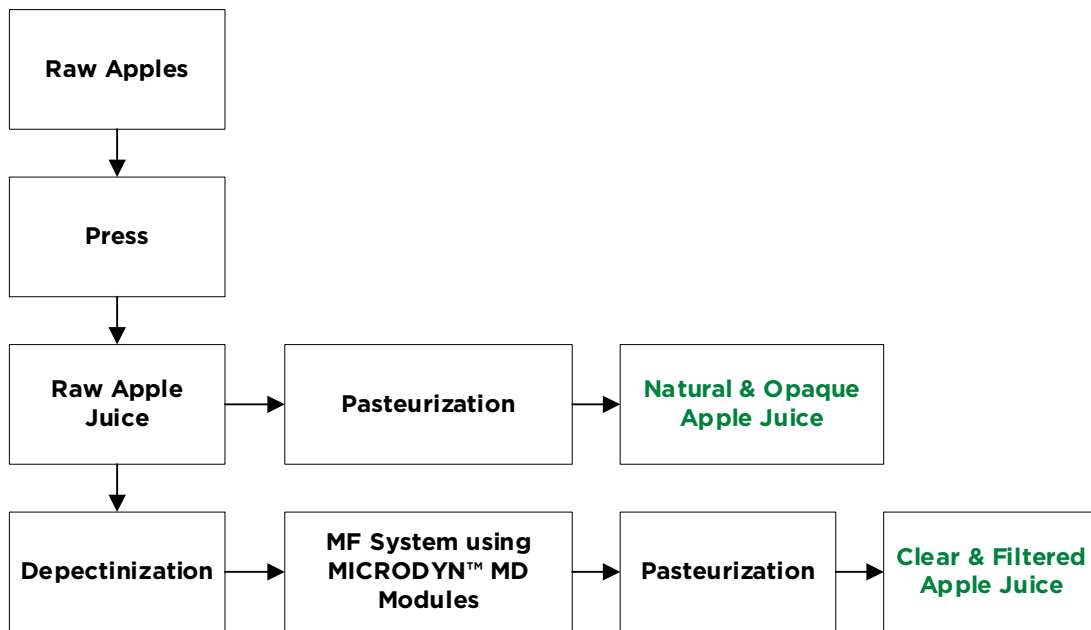


# Apple Juice Clarification

Fruit juices are popular beverages due to their nutritional and antioxidant properties. Apple juice in particular, is a healthy choice because it contains vitamin C and healthy polyphenol antioxidants that are essential for overall health.

Apple juice is processed and sold in many forms. Fresh apple juice or sweet cider is made from ripe fruit that has been pressed and bottled or packaged without preservatives directly into a bottle, called “direct juice”. This fresh apple juice or sweet cider is typically opaque or cloudy because it has not undergone a filtration process to remove coarse particles such as pulp. Clarified apple juice is juice that has been filtered to remove solids and appears more transparent.



**Figure 1.** General process of apple juice clarification.

As summarized in Figure 1 above, after the apples have been harvested, inspected and cleaned, they are sent to a hammer or grating mill for grinding. The juice is then extracted from the mashed apples using a press. Apple juice collected from a press or extractor typically contains suspended solids and other viscous soluble materials (pectin) that have the potential to form after-bottling hazes. The juice may then be directly pasteurized, killing any bacteria present in the fruit puree and denaturing residual enzymes, resulting in a natural-looking apple juice product. For a clear juice product, the raw apple juice is typically enzyme-treated (using pectinase) to hydrolyze the pectin molecules so that they can no longer hold juice. This process is known as depectinization and is an important step to reduce viscosity and help flocculate suspended matter. After the enzyme treatment, the suspended matter is removed from the juice using filtration processes.

Centrifugation is sometimes used to remove high molecular weight solids. For further clarification, tubular or capillary microfiltration membrane modules may be used. Capillary modules such as [MICRODYN™ MD 200 CV](#) or [MICRODYN™ MD 150 CP](#) offer capillaries with an inner diameter of 1.8 mm (0.071 inches).

MICRODYN MF membrane is made of polypropylene, offering great chemical resistance. It is also very resistant to abrasion and other mechanical damage due to its homogeneous construction. MICRODYN MF membrane modules may also be periodically back washed to remove deposited solids from the membrane surface.

After clarification, the clear juice is pasteurized and bottled.

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