

How pressure is improving the taste of juices and how it can be applied in a new cheaper way.

Squeezing tomato and apricot juice through a tiny gap with high pressure is improving the fruit aroma and the mouthfeel. Instead of using juice directly the concentrate can be pressed through the gap which saves energy and production space.

A well-known problem about juices is that the heavy particles sink over time so that unpleasant layers of pulp and a watery juice is formed. To avoid this juice is squeezed through a tiny gap with . Just after this gap there are many turbulences, which break down the pulp particles in small pieces. Because they are so small, it takes much more time to sink. So far it was unknown if this treatment affects the taste in any way. An interesting finding is that the fruit aroma gets improved when more pressure was used.

It is also not efficient to squeeze a lot of useless water through the gap. That is why experiments have been made with concentrated juice.

The benefits of these findings are obvious. Because the volume of juice concentrate is much less compared with fruit juice a smaller and cheaper processing machine can be used. It also saves time and energy and the overall production cost is much lower.

Now, because this method has a huge influence on the taste it is possible to optimize the taste just with regulating the pressure. Since not all flavor parts are affected in the same way there is a possibility to exchange some juice concentrate with water.

For all the tests the thickness, particle sizes and microscope images were determined. The normal produced juices were compared with the pressure treated juices. These results where then compared with the juices where a higher concentrate was pressed through the gap. All the results support each other for correctness. It seems like that it is most important to break down the large whole fruit cells in small pieces. The results showed no benefits for the consumer in destroying the cell fragments even more.

Random people around the food department tested juice samples without knowing how they differed. They scored each samples based on liking. These answers were then analyzed with statistical methods which can detect if the given answers are just randomly spread or if there is a clear distinction among the samples.

It was observed that a gel like a soft tofu was formed after the treatment, which was not recovered once it was broken up. This gel was already partly broken after the juice was pressed through the gap. That made it impossible to compare the gel strength of the samples. Therefor an important step was to mix the juices once the pressure was applied to break all the gels evenly and the real properties could be compared.