# EVALUATION OF FREEZING AS A METHOD OF PRESERVING STRAWBERRY JUICE

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## Objectives

Main: Evaluate freezing as a method of preserving strawberry juice.

Specific: Evaluate the effect of two freezing temperatures (-17ºC and -23ºC).

## Material and Methods

-Parameters analyzed in the laboratory: viscosity (rheometer), stability (turbiscan), Brix degrees (refractometer), pH (pH-meter), color (HunterLab colorimeter) and vitamin C (Iodine titration method.

-Parameters analyzed with tasting panel: color, aroma, appearance, viscosity in the mouth and taste.

## Results

**Table 1. Viscosity, pH, degrees Brix, vitamin C and color results.**

| | (M ± SD) | (M ± SD) |
|---|---|---|
| | **Viscosity** (cP) N= 20 | **pH** N= 6 |
| Fresh | 264,01±2,99[a] | 3,71±0,03[a] |
| Frozen -17 ºC | 276,75±26,04[b] | 3,67±0,08[b] |
| Frozen -23 ºC | 268,18±21,54[c] | 3,66±0,09[c] |

| | °Brix N=2 | Vitamin C (mg/ 100 ml) N=4 |
|---|---|---|
| Fresh | 9,75±0,75 | 89,29±29,59[a] |
| Frozen -17 ºC | 10,50±0,50 | 74,23±13,66[a] |
| Frozen -23 ºC | 10,25±0,25 | 72,18±13,59[a] |

| | N (M ± SD) | N (M ± SD) | N (M ± SD) |
|---|---|---|---|
| | **Color N=6** | | |
| | **L** | **a** | **b** |
| Fresh | 36,55±4,80[a] | 14,59±3,37[a] | 2,81±0,80[a] |
| Frozen -17 ºC | 32,67±0,55[b] | 15,06±0,28[a] | 1,04±0,24[b] |
| Frozen -23 ºC | 32,57±1,20[b] | 15,70±0,41[a] | 1,23±0,57[b] |

Different letters in the same analysis means that the results are significantly different (p valor<0.05).

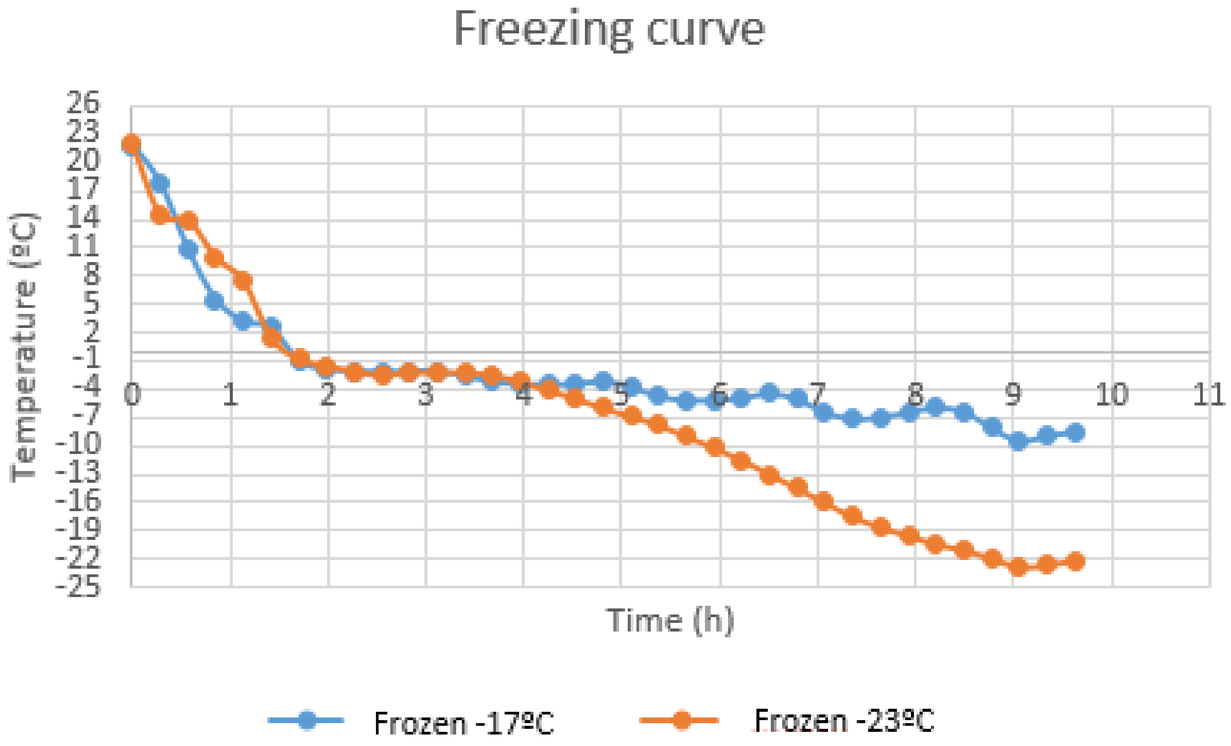


**Figure 1. Freezing curve in strawberry juice frozen at -17ºC and -23ºC.**

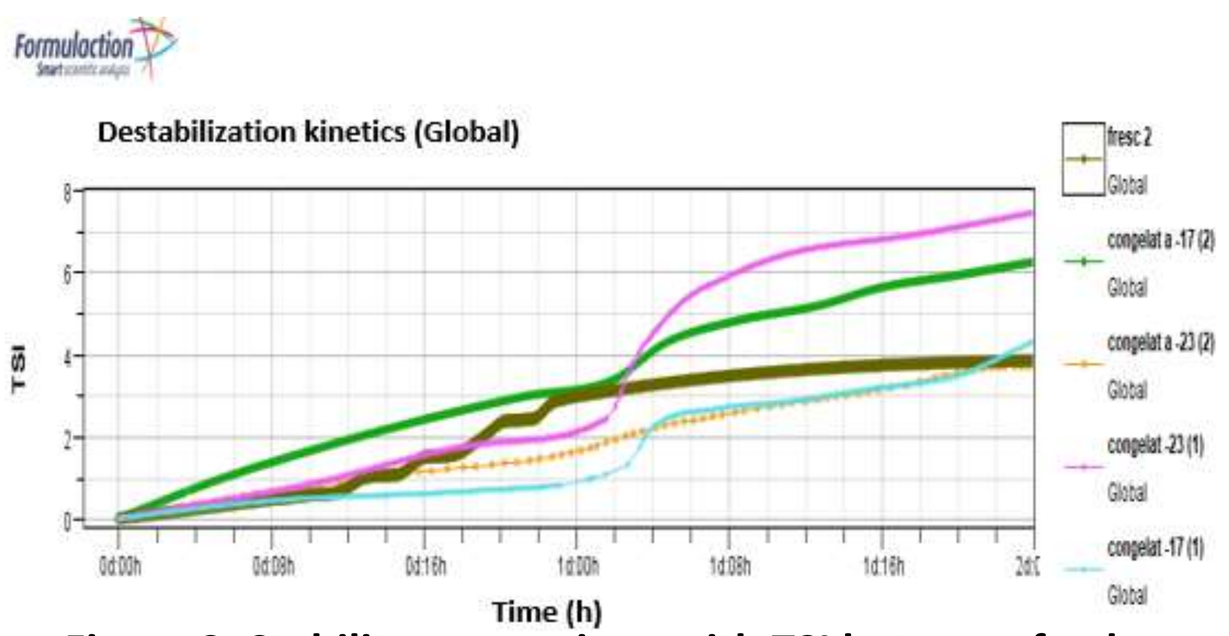


**Figure 2. Stability comparison with TSI between fresh and frozen strawberry juice at -17ºC and -23ºC.**

- An increase of viscosity, Brix degrees and *a* value are observed between fresh and frozen juices. However, pH, vitamin C and *L* and *b* values have experimented a decrease.
- In the tasting, frozen juices were found to be more viscous and with more particles than fresh juice. Instead, a decrease in redness, aroma, appearance homogeneity and sweetness were found in frozen juice in relation to the fresh one. Even though, these results were not statistically significant.

## Conclusions

- Freezing can be used as a method of preserving strawberry juice for two and a half months, due to the fact that freezing doesn't affect in a relevant way the physicochemical properties. In addition, tasters were not able to find significant differences between fresh and frozen juice.
- To improve the study more samples should be analyzed.