

High Temperature Short Time Pasteurisation of Milk

This Technical Standard is limited to milk with a fat content of less than 10%, with no added sweeteners (eg: sucrose or flavoured sugar syrups) or particles (eg: fruit). It provides time and temperature parameters that will ensure pasteurisation is achieved.

High Temperature Short Time (HTST) pasteurisation is a continuous flow process that heats the milk to a minimum temperature, holds it for the required time, and immediately shock cools the milk.

The minimum heat process for the holding time and temperature combination of pasteurisation from the Food Standards Code is¹:

- 72°C for 15 seconds

However, the Food Standards Code also allows for:

- Heating using any other time and temperature combination of equal or greater lethal effect on bacteria.¹

In the case of milk and liquid milk products, the milk is to be immediately shock cooled after pasteurisation to a maximum of 4.5°C. Shock cooling is only applicable to milk and milk products that will be consumed without further processing.

To determine the minimum acceptable temperature for holding times of less than 15 seconds, the following equation should be used²⁻³:

$$T = \frac{14885}{(\log_{10}t + 41.97)} - 273.1$$

Where: T = minimum temperature in °C; and
t = minimum holding time in seconds.

This equation only applies to temperatures above 72°C.

Using this equation, alternative minimum holding times and minimum temperatures for a HTST process are listed in Table 1.

Table 1 – Alternative minimum HTST treatments

Min. holding time (Seconds)	Min. temperature (°C)
1	81.6
2	79.0
3	77.6
4	76.5
5	75.7
6	75.1
7	74.6
8	74.1
9	73.7
10	73.3
11	73.0
12	72.7
13	72.4
14	72.1
15	72.0

References

1. Food Standards Australia New Zealand (2003) 'Food Standards Code' Vol. 2 – Standard 1.6.2
2. New Zealand Food Safety Authority (2003) 'D121.1 Dairy Heat Treatments'
3. Kessler, H.G. (1986) 'Considerations in relation to some technological and engineering aspects'. Ch15, International Dairy Federation Bulletin No. 200

Further information

Other Technical Standards on pasteurisation and dairy food safety topics are available.

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