

Pasteurization of Low Alcohol Beer

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Introduction

Pasteurization is a treatment that is often used in the food industry. When packaged beer is heated for 1 minute at 60 °C this is considered as 1 Pasteurization Unit (PU).

The benefits to pasteurizing a product are improved shelf life and flavor stability.

Pasteurization effectiveness will be affected by the pasteurization temperature, pasteurization time, the type and concentration of micro-organisms present as well as the chemical composition of the product.

When producing low or non-alcohol beer, the alcohol level is too low to inhibit the growth of pathogenic microorganisms. There are sufficient nutrients remaining (sugars, amino acids etc.) in the product to allow for microbial growth. Thus, controlled pasteurization is key to ensuring microbiological and food safety of the final product.



Methods

- In this experiment, the bottled beer was pasteurized to different pasteurization units. Targets were 80, 100, 120 and 150 PU.
- The temperature of pasteurization was set at 64 °C.
- Water was sprayed over the bottles to make sure the temperature was homogeneous.
- Records started when the temperature inside the bottle reached 51 °C.
- After a set period of time, part of the hot water was drained and cold water was added to cool down the bottles to below 50 °C.

Results

Four different pasteurization levels were done to allow the microbiology team to assess the minimum amount of PUs need to render the low alcohol beer microbiological sound.

Table 1.0 Time used to achieve the Final Pasteurization Units

Final Pasteurization Units (PU)	Time Used (MM:SS)
81.6	26:20
101.2	28:10
124.8	31:15
147.1	34:02

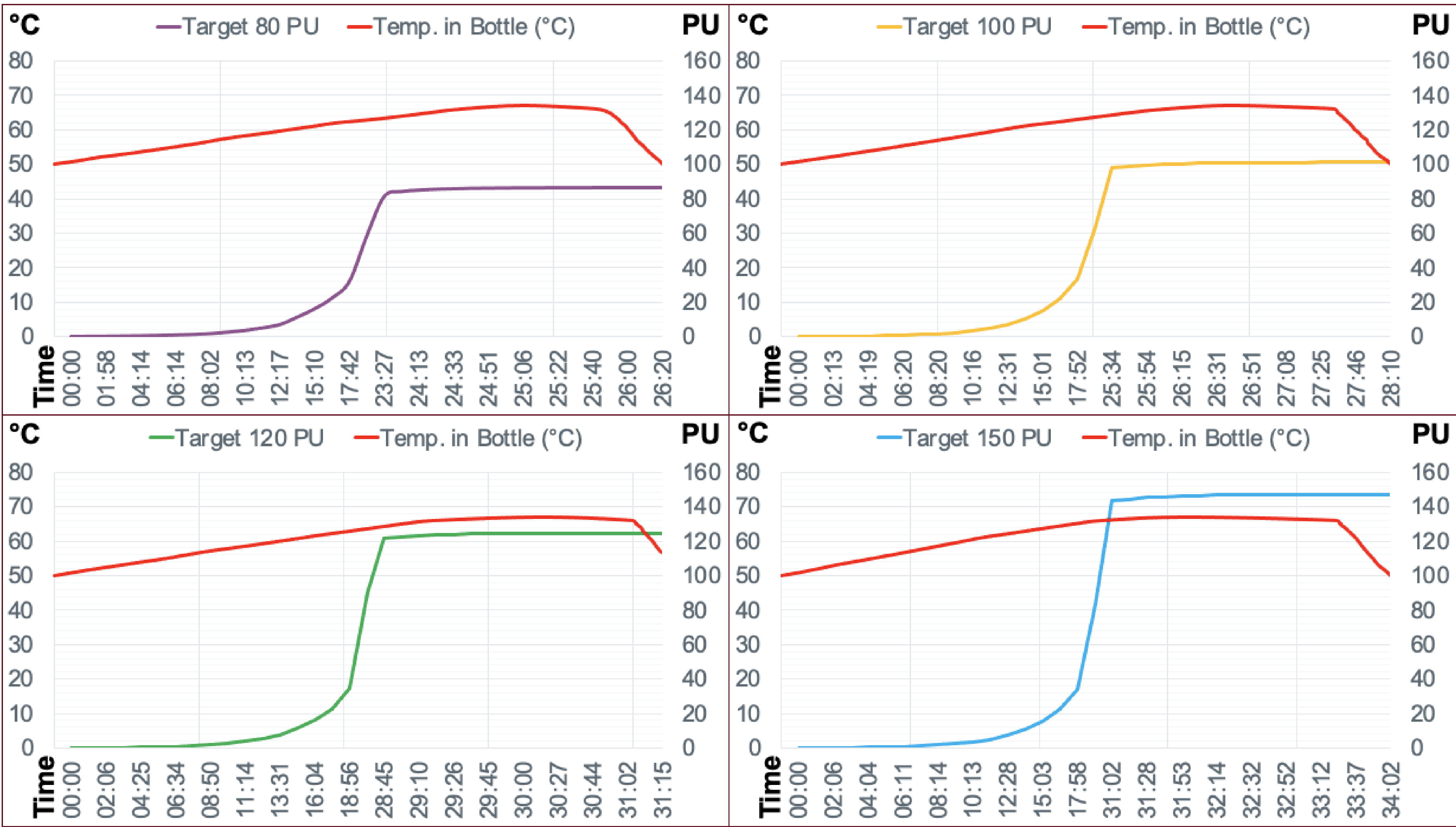


Figure 1.0 Pasteurization Units and Temperature in Beer Bottles as a Function of Time



Conclusions

The final PUs with the same set temperature (64 °C) were determined. The target of 80PU; 100PU and 120PU compared with the final calculated PUs showed an increase of 1.6PU; 1.2PU and 4.8PU respectively. The target of 150PU compared with the final calculated PU showed 2.9PU less.

The results confirmed that the greater the time the low alcohol beer was held above 60°C the greater the pasteurization units it experiences.

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