

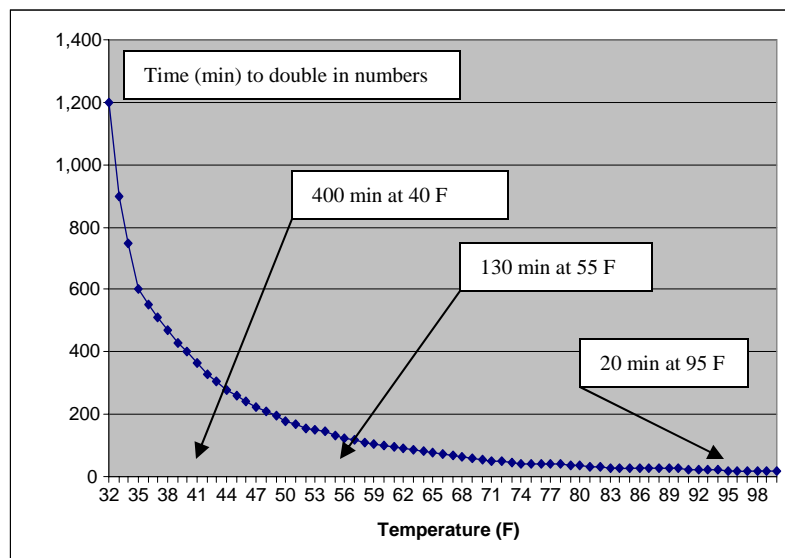


Worthwhile Operational Guidelines & Suggestions

BROILER PROCESSING TIMELY INFORMATION – AUGUST 2007

Bacterial growth as a function of temperature

The growth of a bacterial population is usually measured in terms of increase in number of viable cells. Bacteria multiply by binary fission. Hence, the generation time (or doubling time) is exponential in nature, as each bacterial cell gives rise to two cells, which in turn results in four cells, and so on. However, each bacterial species has an optimum growth temperature range, with well-defined upper and lower limits. Generation time



is usually maximal near the upper temperature limit (see Figure). Bacteria can be classified into three groups based on their optimal growth temperature ranges:

- *Psychrophiles* – grow best between -5 and 30 C (23 to 86 F)
- *Mesophiles* – grow best at 15 and 50 C (59 to 122 F)
- *Thermophiles* – grow best at 50 to above 90 C (59 to 194 F)

However, in actuality, there is no sharp dividing line to separate the temperature at which organisms in each group will grow. Other factors, such as pH, water activity, nutrients and oxidation potential also come into the growth equation. This information should be valuable to limit bacterial growth in processing plant processes involving product handling, chilling, and storage.



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