**Thermization table for raw milk cheese heat treatment**

 Temperature-time (seconds) combinations for thermization of milk to achieve a 3, 4, or 5-log reduction of *Listeria monocytogenes* or Shiga-toxin production *Escherichia coli* (STEC) in milk for cheese making \*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |
| --- | --- | --- |
| **Temperature** | ***Listeria monocytogenes*** | **Shiga Toxin-producing *E. coli*** |
| **⁰F** | **°C** | **3-log** | **4-log** | **5-log** | **3-log** | **4-log** | **5-log** |
| **145** | 62.8 | 155 | 207 | 258 | 64 | 85 | 107 |
| **146** | 63.3 | 129 | 168 | 210 | 52 | 69 | 87 |
| **147** | 63.9 | 102 | 136 | 170 | 42 | 56 | 70 |
| **148** | 64.4 | 83 | 111 | 138 | 34 | 45 | 57 |
| **149** | 65.0 | 67 | 89 | 112 | 27 | 36 | 45 |
| **150** | 65.6 | 55 | 73 | 92 | 22 | 29 | 37 |
| **151** | 66.1 | 50 | 67 | 83 | 18 | 24 | 30 |
| **152** | 66.7 | 41 | 55 | 68 | 15 | 20 | 25 |
| **153** | 67.2 | 34 | 45 | 57 | 12 | 16 | 20 |
| **153.5** | 67.5 | 31 | 41 | 52 | 11 | 15 | 18 |
| **154** | 67.8 | 28 | 37 | 47 | 10 | 13 | 17 |
| **155** | 68.3 | 24 | 32 | 40 | 8 | 11 | 13 |

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* Subject to aging requirements for inactivation of pathogens; other preventative controls must be in place).

FRI links for **Cheese Thermization App**. (copy & paste into search bar)

[https://fri.wisc.edu/resources\_thermization.php](https://fri.wisc.edu/resources_thermization.php%22%20%5Ct%20%22_blank)