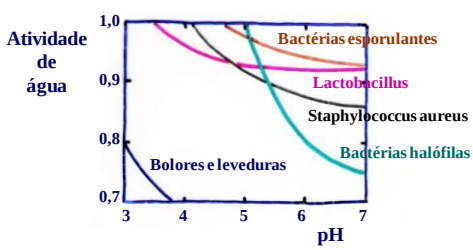
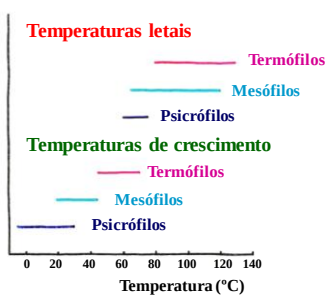
Conservação de alimentos pelo calor

Prof. Dr. Luiz Antonio Gioielli

USP



Influência combinada do pH e atividade de água no crescimento microbiano



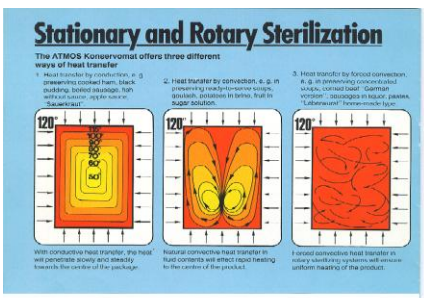
Temperaturas de crescimento e letais para os microrganismos





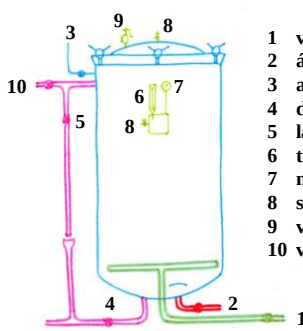



Leite pasteurizado



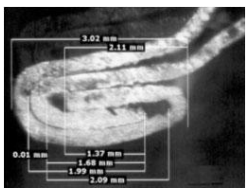
Condução **Convecção** **Convecção forçada**

Transmissão de calor

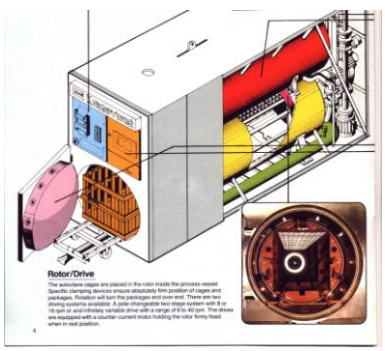


1 vapor
2 água fria
3 ar comprimido
4 dreno
5 ladrão
6 termômetro
7 manômetro
8 sangrador
9 válvula de segurança
10 válvula de exaustão

Autoclave vertical com pressão de ar



Análise de recravação de latas

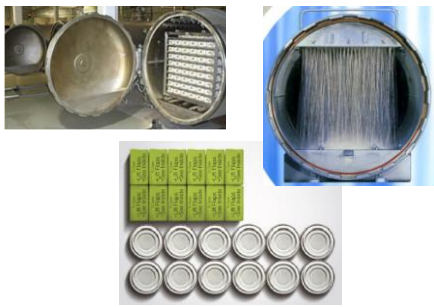


Autoclave a água quente sob pressão



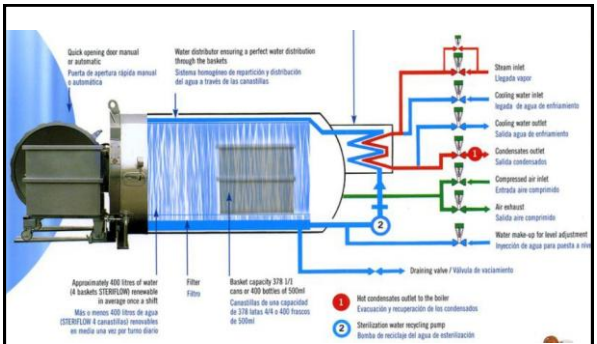
Tetra Recart - Produtos

Fonte: Tetra Pak

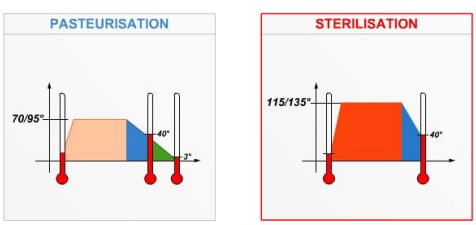


Tetra Recart – Esterilização
Vapor de água – Spray de água quente – Ar comprimido

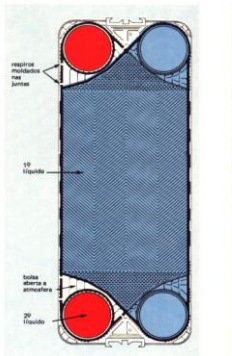
Fonte: Tetra Pak



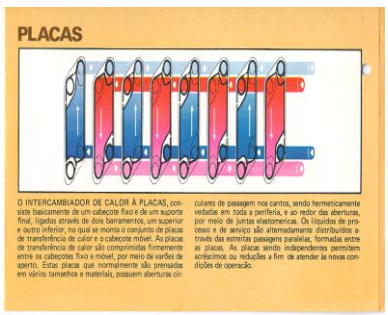
Pasteurização e Esterilização - Steriflow



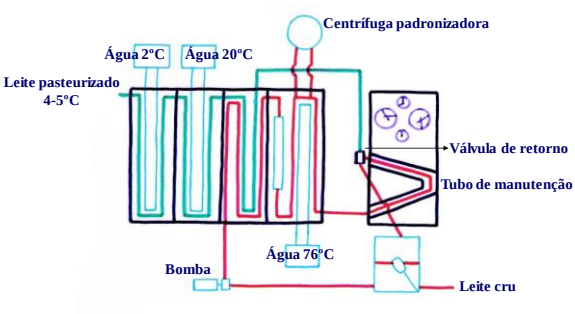
Pasteurização e Esterilização - Steriflow



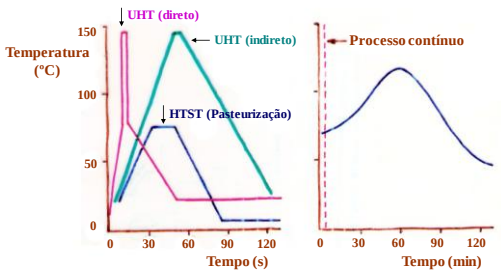
Placa –Trocador de calor



Trocador de calor de placas

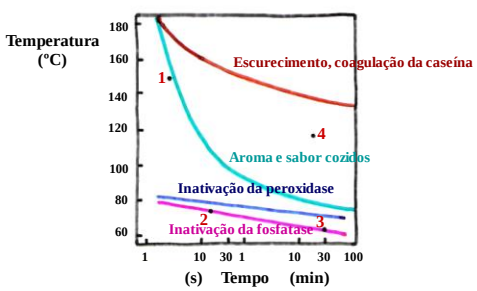


Equipamento de pasteurização do leite



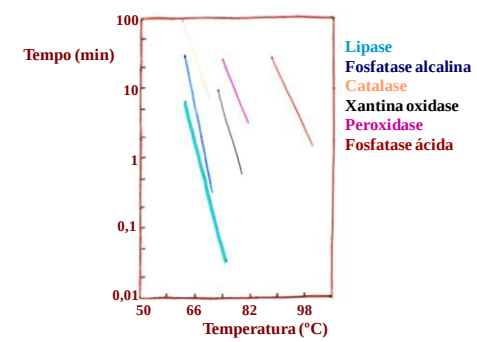
Processo contínuo Processo descontínuo

Tratamento térmico do leite



Influência do tratamento pelo calor nas características do leite

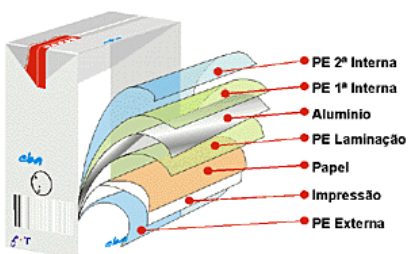
1. Esterilização (UHT)
2. Pasteurização (HTST)
3. Pasteurização (descontínua)
4. Esterilização (descontínua)



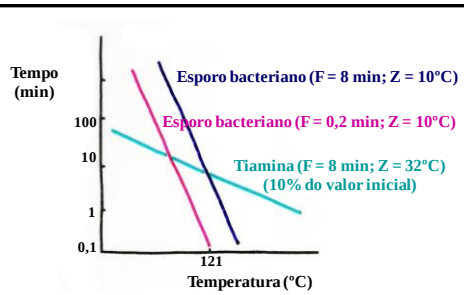
Inativação de enzimas do leite



Envase – Tetra Pak



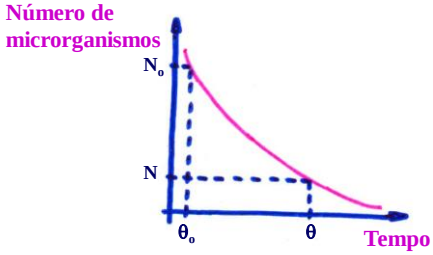
Embalagem Tetra-Pak para leite



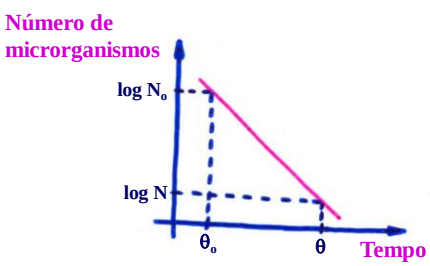
Destruição de esporos bacterianos e da tiamina*
***outro nutriente ou enzima**

Resistência térmica de microrganismos

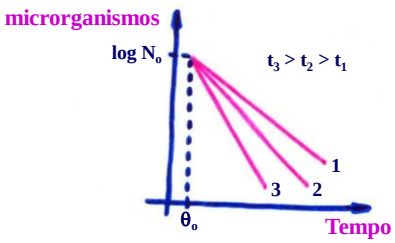
- Curva de destruição térmica
- Tempo de redução decimal
- Tempo de destruição térmica
- Valor Z do microrganismo



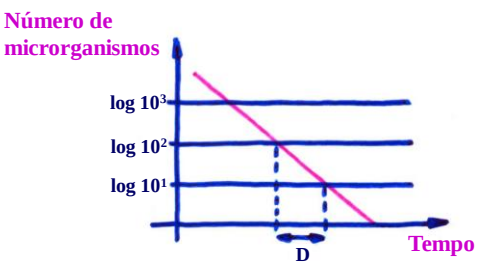
Curva de destruição térmica



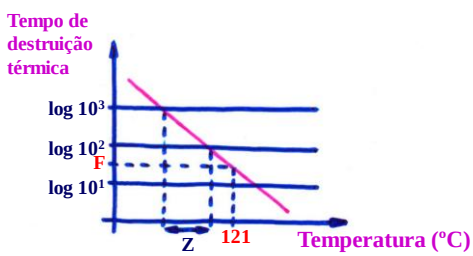
Curva de destruição térmica



Curva de destruição térmica



Tempo de redução decimal (D)



Tempo de destruição térmica (TDT)
Valor Z do microrganismo