Innovations in particle coating

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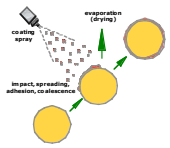
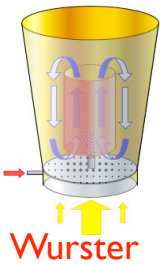
ÉCOLE NATIONALE D'INGÉNIEURS DES TECHNIQUES DES INDUSTRIES AGRICOLES ET ALIMENTAIRES

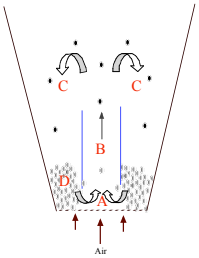
Capsulæ Bioencapsulation & coating

Wurster or spouted bed





Residence times in wurster reactor



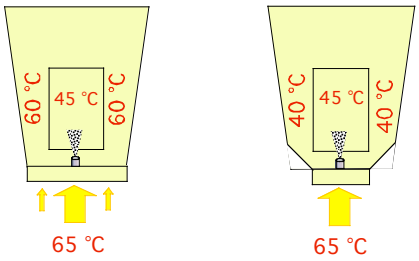
A : Acceleration of particles
(0.05 sec - 1 %)

B : Pneumatic transport
Drying = cooling
(0.15 sec - 2 %)

C : Deceleration of particles
(0.9 sec - 12 %)

D : Expanded bed
Particle overheating ?
(6 sec - 85 %)

Temperature distribution in fluid bed reactors

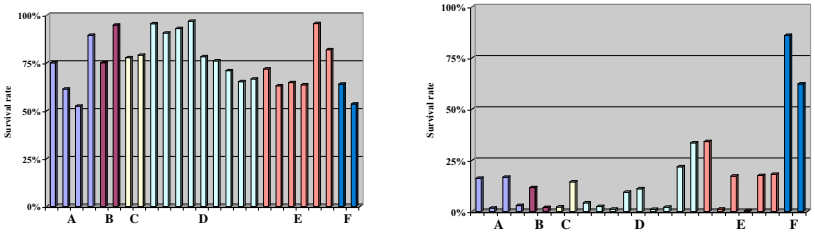


Survival rate of L.casei and L.acidophilus during fluid bed coating

Probiotic strain	Survival rate with the conventional equipment (%)	Survival rate with the modified equipment (%)	Increase of the final cell concentration (%)
L. casei Lc1	40.1 ± 6.9	53.6 ± 7.2	34
L. acidophilus R0052	7.6 ± 1.3	15.3 ± 1.4	102

Improving survival rate of probiotics during coating and pelleting

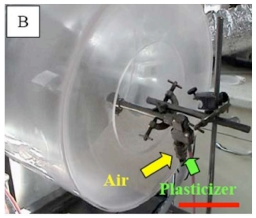
Lactobacillus Acidophilus

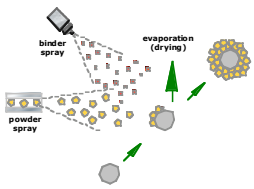


A: cellulose and starch - B: gums - C: Proteins - D: oils - E: waxes - F: double coatings

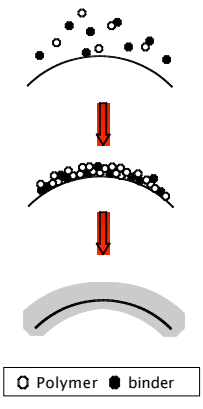
Survival rate during coating and pelleting process (70°c)

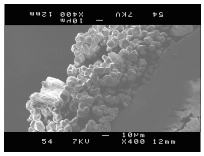
Particle dry coating



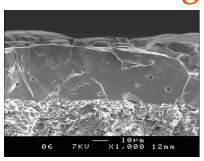


- Spray = fine powder + plastifiant
  - Starch + triethyl citrate
  - Phytowax + triethyl citrate
- Fast process (15 min)
- Air at room temperature
- Porous coating >>> Curing step





before curing



after curing

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