“Successful Implementation of new Technologies”

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Outline

1. Short history
2. Human factors influencing new developments
3. Role of machine company in new developments
4. Role of processing company in new developments
5. Complications by the implementation of new technologies
6. Successful implementation of the HCC
1-Short history

German cocoa machine companies 1946
Information obtained from British Intelligence Report

J.M. Lehmann – Dresden
Large part of machines and young technical staff evacuated to Russia near Rostov
Types of equipment they plan to built are: winnowers type 500 and 1000 Kg/h, cocoa nib refiner, standard range of melangeurs, Refiner type 912, a conche type not yet determined (not the SylKonche), automatic tempering machines, shell plants and moulding units.
**Automatica**  
**RRH 5**  
*Refiner/conche*

Droste Chocolate Company  
Haarlem, The Netherlands

Was in use during the 70’s
Specifications RHH 5

- Motor 110 KW
- Power 170 amp during normal operation
- Capacity 650 kg/h
- Operating temperature 50 deg
- Cooling water need 1200 l/h with temperature increase of 2,5 deg
- Media porcelain balls
  - 4,5 mm
  - 5,5 mm
  - 6,5 mm
- Shaft speed 150 rpm
- Need of using powder sugar
- Special metal ball clutch to overcome high starting torque “Metalluk”
Why this machine?

1. Increase capacity
2. Necessary modernization from manual mixing raw ingredients and longitudinal conching
3. Limited space in factory
4. A one step refining and conching process
5. More consistent quality
6. Relative low investment
7. Totally automated chocolate making process
8. Food safety improvements
Disadvantages of the RHH 5

- Wet conching technology
- Risk of small amount of big particles in chocolate
- Porcelain in product
- Not easy to replace or screen the balls
- High power need for startup, between 840 and 1000 amp
- Not possible to restart machine when stopped during full operation as result of the thixotropic behavior of chocolate

- Extra cocoa butter during 2 hours after startup
- Extra cocoa butter during 3 hours before shutdown
2 - Human factors influencing new developments

- Not afraid to make mistakes
- Curiosity
- Communication skills
- Persistence
- Analytical skills
- Optimistic
- Realistic
- Team player
3 – Role of machine company in new developments

- Stay ahead of competition
- Bring value to customer
- Customer support
- Customer intimacy
- Offer practical solutions
- Enter into joint developments agreements with customer
4 – Role of processing company in new developments

- Willingness to share information with machine company (possible secrecy agreement)
- Dedicate the right resources for the implementation of new technologies
- Form an team with specialists
- Stay ahead of competition
- Accept the risk of failure
- Make sure there is support high in the organization
5 - Complications by the implementation of new technologies

- Objective evaluations of performance
- Time pressure
- What to do with product out of specification
- Find the right course of failure
- Don’t jump to conclusions
- Having the right human resources available
- Too many variables
HCC Technology

“Successful Implementation of New Technologies”

Pasting Station

Weighing Station & Homogenizer
HCC variables

- Recipe
- Raw ingredient fluctuations
- Particle size (distribution)
- Initial butter dosing
- Initial lecithin dosing
- Butter injection in barrel
- Air temperature
- Barrel temperature
- Speed shaft
- Gap adjustment
Experience during HCC implementation

- Very conservative industry (customers)
- Very conservative location management
- Going from a 10 to 36 hours batch process - to continuous conching in 6 minutes was a different world
- No objective taste penal was in place
- Mindset that it could never work in whole factory
- We did 72 test runs to come up with right match
- After proof it was working well, long process of acceptance and implementation
- Now in operation since 1994
Using statistical software during test runs will make life much easier !!!

Software used in example JMP 11 from SAS
### Suggested Testing Program

<table>
<thead>
<tr>
<th>Test</th>
<th>Process Temp</th>
<th>Initial Lecithin</th>
<th>Initial Butter</th>
<th>Speed of Shaft</th>
<th>Gad Adjustment</th>
<th>Yield Point</th>
<th>Viscosity</th>
<th>Flavor</th>
<th>Energy</th>
<th>Throughput</th>
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By conventional testing program: 243 tests variations
The road to new technologies is hard but very rewarding