<table>
<thead>
<tr>
<th>Parameters</th>
<th>Blend</th>
<th>Processing</th>
<th>Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taste</td>
<td>XX</td>
<td></td>
<td>XX</td>
</tr>
<tr>
<td>Taste keepability</td>
<td>XXX</td>
<td></td>
<td>XX</td>
</tr>
<tr>
<td>Homogenity</td>
<td>X</td>
<td>XXX</td>
<td></td>
</tr>
<tr>
<td>Hardness</td>
<td>XXX</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spreadability</td>
<td>XXX</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Heat stability</td>
<td>XXX</td>
<td>X</td>
<td>XX</td>
</tr>
<tr>
<td>Oral melt</td>
<td>XXX</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Emulsion stability</td>
<td>X</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>Plasticity</td>
<td>X</td>
<td>XX</td>
<td>X</td>
</tr>
<tr>
<td>Baking performance</td>
<td>X</td>
<td>X</td>
<td>XX</td>
</tr>
<tr>
<td>shallow frying</td>
<td></td>
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</tbody>
</table>
FAT BLEND- Product characteristic defines N-line

- **Spreadability**
  - from the refrigerator; N10
  - at ambient temperature; N20

- **Stability**
  - mainly N20 or N25

- **Heat stability**
  - at which temperature; N30?

- **Oral melt and Taste**
  - mainly N35
How to influence consumer requirements by the N-line

FAT BLEND - Product characteristic defines N-line

Temperature

Solids

Better spreadable

More ambient stable

Better oral melt and taste
FAT BLEND - Product characteristic defines N-line

SFC at 20°C

- NMR 20°
- U Spec = 6.00
- Average = 4.95
- L Spec = 3.50

SFC at 35°C

- 35 derecedeki NMR
- U Spec = 5
- Average = 3.2
- L Spec = 2

sMp

- EN
- U Spec = 36
- Average = 34.6
- L Spec = 32
Almost all ingredients have an effect on the taste of the final product, this can be positive / negative.

Ingredients like milkpowder, acids, salt and flavours (antioxidants)

- Specifying quality into ingredients but specify only what is relevant
- Buying the ingredients with analyses certificate from the approved suppliers
- Minimising stirring, pumping, storage time and temperature variations
## INGREDIENTS - example

<table>
<thead>
<tr>
<th></th>
<th>Skimmed Milk Powder</th>
<th>Lecithin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>max.5</td>
<td>max.2</td>
</tr>
<tr>
<td>pH</td>
<td>6.65±0.15</td>
<td>-</td>
</tr>
<tr>
<td>Colour/appearance</td>
<td>White, clean</td>
<td>Brown, viscous</td>
</tr>
<tr>
<td>Total count</td>
<td>max. 100.000/g</td>
<td>Max.5000/g</td>
</tr>
<tr>
<td>Coliform</td>
<td>max.10</td>
<td>-</td>
</tr>
<tr>
<td>Acid number</td>
<td>-</td>
<td>max.30</td>
</tr>
<tr>
<td>Peroxide</td>
<td>-</td>
<td>max.5</td>
</tr>
<tr>
<td>Criteria</td>
<td>Wrapper &amp; Tub Margarines</td>
<td>Bakery Margarines</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>* Fat, %</td>
<td>40-82</td>
<td>Min.82</td>
</tr>
<tr>
<td>Water, %</td>
<td>16-60</td>
<td>max.16</td>
</tr>
<tr>
<td>* FFA ,%</td>
<td>max. 1 (0,5)</td>
<td>max. 1 (0,5)</td>
</tr>
<tr>
<td>* POV</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>pH (acidity)</td>
<td>4,4-4,7</td>
<td>2,5-4,5</td>
</tr>
<tr>
<td>* sMp</td>
<td>max.36</td>
<td>max.45</td>
</tr>
<tr>
<td>Colour</td>
<td>3,5-5 R</td>
<td>3,5-5,5 R</td>
</tr>
<tr>
<td>Salt, %</td>
<td>0,18- 0,3</td>
<td>Max.0,2</td>
</tr>
</tbody>
</table>

* TSE (Turkish Standarts Institute, Margarine Standart)
### PROCESSING

#### Processdata indication 1

- **Date:** 03.12.2007 / 11:16
- **Time:** 11:07
- **Status:** 11:12 temp. F-C102 rework cyl. too high

### Production

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>piston pump</td>
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</tr>
<tr>
<td>heating cylinder</td>
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<tr>
<td>cooling coil</td>
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</tr>
<tr>
<td>cooling cylinder 1</td>
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<tr>
<td>cooling cylinder 2</td>
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</tr>
<tr>
<td>cooling cylinder 3</td>
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<tr>
<td>rework kombinator</td>
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<tr>
<td>emulsions - stirrer 1</td>
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<td></td>
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</tr>
<tr>
<td>emulsions - stirrer 2</td>
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<td></td>
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</tr>
<tr>
<td>WWH kombinator (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWH rework cyl. (2)</td>
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<td></td>
</tr>
<tr>
<td>WWH cooling cyl. 3</td>
<td></td>
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</tr>
<tr>
<td>filling temperature</td>
<td>max. 24</td>
<td>min. 2</td>
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</tr>
</tbody>
</table>

### Return Temperature [°C]

- **MAX.** 58
- **MIN.** 52
- **PV-X** 43
Margarine Quality

Sensory Evaluation & Performance Test
SENSORY EVALUATION

Linking the Consumer to the Margarine Producer

Sensory Evaluation Methods

FOR TUB MARGARINES;

- Spreading on the bread
- Tasting

FOR WRAPPER MARGARINES;

- Cooking Performance
- Baking Performance
PERFORMANCE EVALUATION

Linking the BAKER to the Margarine Producer

Performance Evaluation Methods

- Physical Tests

- Baking Performance Tests
During the baking, Fat between the layers melts Layers opened Dough widens Crispiness increase

The FAT be:

- Not broken easily
- Homogenous structure
- in good plasticity
- Not be sticky
- Rheology of the dough be equal to rheology of fat

SFC at 20 °C : % 38-42, at 30 °C : % 18-23, at 35 °C : % 12-16
sMp: max.42°C
Puff Pastry – Performance Trial

Mixing of Flour, water, salt & citric acid

800 gr. dough pieces rounded

Cutting the doughs and resting
350 gr fat OR 375 gr margarine

Placed in the middle of dough.

Fat is packed with the dough.
Dough rested 10-15 min.
Then
lamination

90° turned,
Laminated till 8 mm’
3 turn
Rest in refrigerator 45 min.
Lamination
4-5 turns
final thickness 7-8 mm

Special device, cutting
1 hour resting
Baking at 240-260°C
20 min.

QUALITY CHECK
**CREAM FATS**

**CONSTRAINTS**

- Neutral taste
- Good sticking to biscuit
- Good creaming properties
- Rapid setting
- Good cooling effect

**BY**

- Good refining deodorisation
- Not too hard not too soft
- Well plasticised homogeneous
- Crystallisation rate
- Steep N-line

*SFC at 20 °C : % 22-26,*
*at 30°C : % 8-12*
*at 35°C : % 4-8  sMp: max.38°C*
Cream Fat – Performance Trial

Whipping Performance is measured by specific volume

600 gr. fat  %30 water +% 70 crystal sugar= sol’n
10 min. Mixing at high speed (SP1)  600 gr fat + 250 gr.sol’n mix 10min.(SP2)

Cup weight with sample – empty cup weight = SPESIFIC VOLUME(gr/cm$^3$)(SP)
cup volume

Ideal Performance: SP1 < 0,3 g/cm$^3$, SP2 < 0,4 g/cm$^3$
ALL PURPOSE FATS & MARGARINES

Bakery margarines

Consistency/hardness
not too hard at 10-15 ºC
not too soft at 30-35 ºC

Plasticity, Worksoftening

Creaming performance (high air intake)

Taste keepability, Taste after baking

SFC at 20 ºC : % 22-28
at 30 ºC : % 10-15
at 35 ºC : % 5-8

sMp: max. 40ºC
All Purpose Margarine – Performance Trial

Penetration measurements at 20 °C and 30 °C

Plasticity Control by hand

no air cracks, not easily broken, Not sticky
Volume, shape, colour of the product
CAKE PERFORMANCE

Air keepability  
Volume  
Crumb and crust structure
Industrial fats

- Crystallisation rate
- Fatty acid composition
- Rancimat
- Stability
- Consistency
- Colour
- Foaming / Smokepoint
The Customer is anyone affected by the Product
Voice of Customer

- Listen the customer
- Get the complains
- Physical & chemical & performance controls
- Find out the reason of the problem
- Share the result with staff
- Inform the customer about the result
Quality is defined by the Customer
Proud of herself with delicious products for the HOUSEWIFE

the way of showing his expertise for the BAKER
the best formulation for the product

Production according to the specs

for

the R&D MANAGER

for

the PRODUCTION CHIEF
QUALITY

For the QC MANAGER product without defect
QUALITY

Customer satisfaction
THANK YOU FOR YOUR ATTENTION