Goodness of Grain for Health of our Society

International Whole Grain Food Symposium
April 20 – 21, 2011
Beijing, China

Walter von Reding
AGENDA

- Buhler Group
- Global Trends
- Key Challenges
- Grain Processing for healthier Grain fractions
- Partnership Buhler & Cargill
**Buhler at a glance**

- Annual sales: ~ CHF 2 bn.
- Employees worldwide: 8000
- 100%-owned by Urs Bühler (Chairman of the Board).
- Powerful self-financing with high equity ratio.
- Sustainable annual sales growth of minimum 6% as target.
- Average EBIT margin of 8% as target.
- Market leadership in relevant markets achieved or aimed at.

Urs Bühler, Chairman of the Board  
Calvin Grieder, CEO
# Buhler Group

<table>
<thead>
<tr>
<th>GRAIN PROCESSING</th>
<th>FOOD PROCESSING</th>
<th>ADVANCED MATERIALS</th>
</tr>
</thead>
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<tr>
<td>Grain Milling</td>
<td>Pasta &amp; Extruded Products</td>
<td>Die Casting</td>
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<tr>
<td>Feed &amp; Biomass</td>
<td>Chocolate &amp; Cocoa</td>
<td>Grinding &amp; Dispersion</td>
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<tr>
<td>Sortex &amp; Rice</td>
<td>Buhler Aeroglide</td>
<td>Thermal Processes</td>
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<td>Grain Handling</td>
<td>Nutrition Solutions</td>
<td>Nanotechnology</td>
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<td>Malting</td>
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## SALES & SERVICES

## MANUFACTURING & LOGISTICS

## FINANCE & ADMINISTRATION

## CORPORATE TECHNOLOGY
Buhler is the global specialist and technology partner for plant design & construction and services for transforming renewable raw materials into foods and synthetic materials into high-grade functional products and valuable substances.

The Group's core technologies are in the field of mechanical, thermal, and biological process engineering.

Buhler has been a competent partner for 150 years in the areas of consulting, technology, development, project management, and service.
## Buhler Global Market share

<table>
<thead>
<tr>
<th>Product</th>
<th>Global Production</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEAT</td>
<td>330m t/a</td>
<td>66%</td>
</tr>
<tr>
<td>CHOCOLATE</td>
<td>4.0m t/a</td>
<td>65%</td>
</tr>
<tr>
<td>PET</td>
<td>8.9m t/a</td>
<td>60%</td>
</tr>
<tr>
<td>PASTA</td>
<td>5.5m t/a</td>
<td>50%</td>
</tr>
<tr>
<td>SOY/GRAIN HANDLING</td>
<td>425m t/a</td>
<td>25%</td>
</tr>
<tr>
<td>BIOMASS</td>
<td>330m t/a</td>
<td>20%</td>
</tr>
<tr>
<td>DIE CASTING</td>
<td>4.8m t/a</td>
<td>20%</td>
</tr>
<tr>
<td>RICE</td>
<td>1138m t/a</td>
<td>15%</td>
</tr>
<tr>
<td>FEED</td>
<td>8.9m t/a</td>
<td>15%</td>
</tr>
</tbody>
</table>
Global Trends
Development of the global population
Global Trends
Staple food requirements

- Wheat is the most important food for over three billion people
- 2 billion people live on rice
- 1 billion people consume mainly corn
**Food Security**

- Overall increases in food production have not always translated into more food for the poor.
- FAO has identified 88 "food deficit" countries which can neither feed themselves nor afford the imports they need.
- Distribution heavily dependent on global imbalances, politics, conflicts and wars.
Food Security

- Hunger still an important issue
- 800 Million people suffer from hunger
- Every minute about 11 children younger than 5 years dying of hunger-related causes
**Trends in Nutrition**

**Efficient Nutrition**
Fast but nutritious and healthy

**The hypochondriac factor**
- More information
- More evidence for claims
- More control through 'food plus', 'food minus' and 'natural' alternatives

**Guilt free indulgence**
Low & light – without compromises on taste and texture

**The time factor**
- More individual (portion) control
- More control over time and quality of preparation

**Convenience plus**
Convenience with restaurant quality and entertainment value

**The sensory experience**
- More fun and entertaining
- More ethnic and exotic tastes
- More premium and indulgent
Health Issues 21st Century
Obesity is increasing world-wide ...

Prevalence of obesity in HK
香港肥胖症發病率 (BMI >25)

Asia Pac. J. Clinical Nutrition 2008
About 15% of Chinese adults - or 200 million people are classified as overweight. Of these, 90 million - about 7 percent are obese.

National Geographic News “Obesity Explosion May Weigh on China's Future”
Health Issues 21st Century China

China "has entered the era of obesity," says Ji Chengye, a leading child-health researcher. "The speed of growth is shocking."

BEIJING — China is super-sizing its children as fast as its economy, prompting fears of an American-style obesity crisis here.

New figures from the Health Ministry show that urban Chinese boys age 6 are 2.5 inches taller and 6.6 pounds heavier on average than Chinese city boys 30 years ago.

A generation of economic expansion has produced higher living standards and allowed Chinese families to put more food on the table; once-scarce meat, dairy products and vegetables now are widely available.

Growing prosperity also has led to more sedentary lifestyles: less physical labor, fewer trips on foot and by bicycle, more travel by car, more Internet usage.
Ageing influence on personal Health and well-being

Age (Years) vs. Percentage of normal Function

- Mental Performance
- Cardiovascular Health
- Digestive System
- Immune System
- Anti-Oxidative Support
- Bone Density
- Muscle Mass

Trends for different health indicators over age.
Food Safety

- Pesticide
- Fungicide
- Microorganism
  - Salmonella
  - Clostridium perfringens
- Aflatoxine / Mycotoxine
Global Trends
Key Challenges

- Food and water supply world-wide
- Malnutrition nutrients deficiency
- Problems with energy balance (eating disorders, obesity - type two diabetes, heart disease, cardiovascular disease)
- Increased concerns about food safety
- Social trends (anti-globalization, demand for traceability of food and ingredients, different lifestyle patterns and family structures)
- Increased demands for transparency in risk management practice and public involvement in policy development
Localisation of the potential health benefits within the wheat kernels

Potential health benefits

- Heart health
  - Risk reduction CVD
  - Risk reduction Type 2 diabetes

- Gut Health

- Weight Management
Localisation of the potential health benefits within the wheat kernels

- Wheat kernel and bran fractionation (traditional milling, novel technologies and processes)

- Characterisation of the samples from fractionation:
  - Chemical composition
  - Microstructure
  - Functional properties

X. Rouau, 2006, INRA
Localisation of the potential health benefits within the wheat kernels

Markers for the grain layers

Outer pericarp: FA – trimers
Intermediate layer: Alkyresorcinols
Aleurone cell walls: P-coumaric acid
Aleurone cell content: Phytic acid
Starchy endosperm: Starch

Y. Hemery, INRA
## Bühler samples – Wheat Aleurone technology/process

<table>
<thead>
<tr>
<th>Sample name</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Wheat aleurone 1</td>
<td>Bran fraction highly enriched in aleurone cells</td>
</tr>
<tr>
<td>Wheat aleurone 2</td>
<td>Further separation of wheat aleurone resulting in high purity aleurone cells</td>
</tr>
</tbody>
</table>
Wheat Aleurone Solution
Value Propositions

- Grain based Natural Ingredient
- Nutritional Labeling
- Health Attributes (Digestive Health, Immune System, Heart Health)
- Technological functionalities (pentosan)
- IP protected Ingredient
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