Edible coating:
Vegetable casing solution
by Ruitenbering Ingredients

VegaCasing
Patented vegetable casing for continuous sausage production
Edible coating: VegaCasing®, the vegetable casing solution

- Introduction
- Alginate co-extrusion principle
- Co-extrusion: choice of substrate
- Cross-linking mechanism
- Co-extrusion process
- From collagen to alginate
- Applications
- Conclusion
Rudin®VegaCasing Technology

- Rudin®VegaCasing is an alginate based gel.
- Rudin®VegaCasing gel in contact with a calcium bath forms a film (casing).
- Rudin®VegaCasing unique flowing properties allow for an even and uniform gel distribution on sausage surfaces prior to film forming.
- Rudin®VegaCasing on controlled processed conditions lends itself to portioning, hanging, smoking and thermal processing.
Co-extrusion: choice of substrate

**Collagen based**
- Protein
- Animal origin:
  - Bovine or porcine
- Available technology:
  - Cross linked with liquid smoke or derivatives of liquid smoke

**Alginate based**
- Polysaccharides from seaweed
- Vegetable origin:
  - Vegetarian products
  - No BSE issues
  - Halal / Kosher
- Available technology:
  - Cross linked with calcium chloride
  - Instant film formation
  - Small amount of skin
### Alginate / collagen mixture?

Solubility of both products depends very much of pH of the system.

<table>
<thead>
<tr>
<th>pH</th>
<th>alginate</th>
<th>collagen</th>
<th>functional</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>precipitates</td>
<td>precipitates</td>
<td>collagen X-link</td>
</tr>
<tr>
<td></td>
<td>(alginic acid)</td>
<td>(i.e.p.)</td>
<td></td>
</tr>
<tr>
<td>4.5-5</td>
<td>solution</td>
<td>precipitates</td>
<td>alginate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(i.e.p.)</td>
<td></td>
</tr>
</tbody>
</table>
Mechanism: skin formation

$\text{RC}=\text{O} \rightarrow \text{Collagen paste}$

$\text{Ca}^{2+} \rightarrow \text{Cross-linked Collagen}$

$\text{Sodium Alginate} \rightarrow \text{Calcium Alginate}$
Co-extrusion
Process differences

**Collagen**
- Extrusion
- dehydration
- drying
- cross-linking
- drying
- desired treatment

**Alginate**
- Extrusion
- fixation Ca++
- desired treatment
## From Collagen to alginate

<table>
<thead>
<tr>
<th>aspect</th>
<th>collagen</th>
<th>VegaCasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material flow</td>
<td>Variable</td>
<td>Constant</td>
</tr>
<tr>
<td>Cross-linking speed</td>
<td>Slow</td>
<td>Rapid</td>
</tr>
<tr>
<td>Dehydration</td>
<td>Necessary</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Skin formation</td>
<td>At end of process</td>
<td>Immediate</td>
</tr>
<tr>
<td>Belt marks</td>
<td>Difficult to prevent</td>
<td>None</td>
</tr>
<tr>
<td>Adhesion to dough</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Skin stability</td>
<td>Good</td>
<td>Good (special attention)</td>
</tr>
<tr>
<td>Appearance</td>
<td>Dull</td>
<td>Shiny or dull</td>
</tr>
<tr>
<td>Heat resistance</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Energy consumption</td>
<td>Substantial</td>
<td>Low</td>
</tr>
<tr>
<td>Waste flow</td>
<td>Substantial</td>
<td>Low</td>
</tr>
<tr>
<td>Mouth feel</td>
<td>Tough</td>
<td>Tender</td>
</tr>
</tbody>
</table>
Alginate: the material of choice for co-extrusion

- Rudin® VegaCasing is a well designed mix of ingredients based on alginate technology.
- For consistency reasons, Rudin® VegaCasing is elaborated with care (HACCP, BRC level A) at Ruitenbergen's facilities in the form of a gel, and delivered chilled.
- Only Rudin® VegaCasing can be extruded as an extremely thin layer at high speed with a low usage rate.
- This potential thinness is made possible only on the ConPro system.
Rudin® VegaCasing current applications

- **Perfect solution for**:
  - Fresh sausages (Chipolatas, Salchichas frescas, Longaniza, American breakfast)
  - Breakfast sausage (UK type with rusk)
  - Dry sausages (fuet, chorizo, meat stick, any small calibre dry sausage)
  - Semi-dried/cooked sausages (Kabanos)
Rudin® VegaCasing & ConPro strengths

- Quality of equipment
- Flexibility (length, calibre, casing type, …)
- Technological edge: better end product
- Consistency and accuracy (weight control)
- High output
- Versatility of VegaCasing
- Versatility of applications
- Intense collaboration of Handtmann and Ruitenberg
- Confirmed market success
Rudin®VegaCasing & ConPro

The new casing technology for continuous sausage production