

Toronto
18 Sept 2008

**Edible coating :
Vegetable casing solution
by Ruitenberg 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 ?

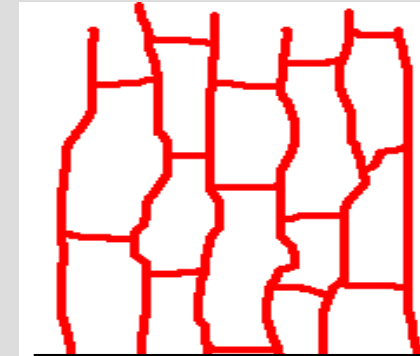
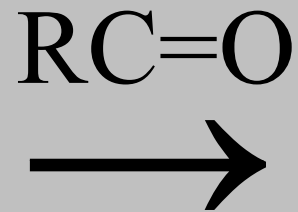
Solubility of both products depends very much of pH of the system.

pH	alginate	collagen	functional
3	precipitates (alginic acid)		collagen X-link
4.5-5	solution	precipitates (i.e.p.)	alginate

Mechanism: skin formation



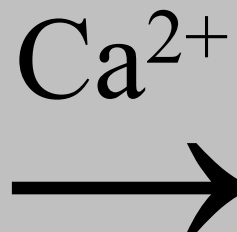
Collagen paste



*Cross-linked
Collagen*



Sodium Alginate



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

aspect	collagen	VegaCasing
Raw material flow	Variable	Constant
Cross-linking speed	Slow	Rapid
Dehydration	Necessary	Not applicable
Skin formation	At end of process	Immediate
Belt marks	Difficult to prevent	None
Adhesion to dough	Good	Good
Skin stability	Good	Good (special attention)
Appearance	Dull	Shiny or dull
Heat resistance	Good	Excellent
Energy consumption	Substantial	Low
Waste flow	Substantial	Low
Mouth feel	Tough	Tender

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 Ruitenberg'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**