

Canadian Feed Research Centre

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Technology
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Canada's Feed Industry

- > \$4 billion in sales in 2010
- 30 MMT feed ~ 20-30% of total grain production
 - 20 MMT commercial
 - 500 commercial mills
 - 10 MMT on farm
- 60 to 80% of diet is grain
 - Protein meals (oilseed meal / animal meal / DDGS)
 - Fats
 - Vitamins / Minerals
 - Additives
- Feed Processing ~0 to 5% of feed costs (\$200M)

Feed Technology

The basics:

- Almost all ingredients used in feed are ground...
- Typically, feed processing uses some form of hydro-thermal process
 - hydro – moisture
 - thermal – heat

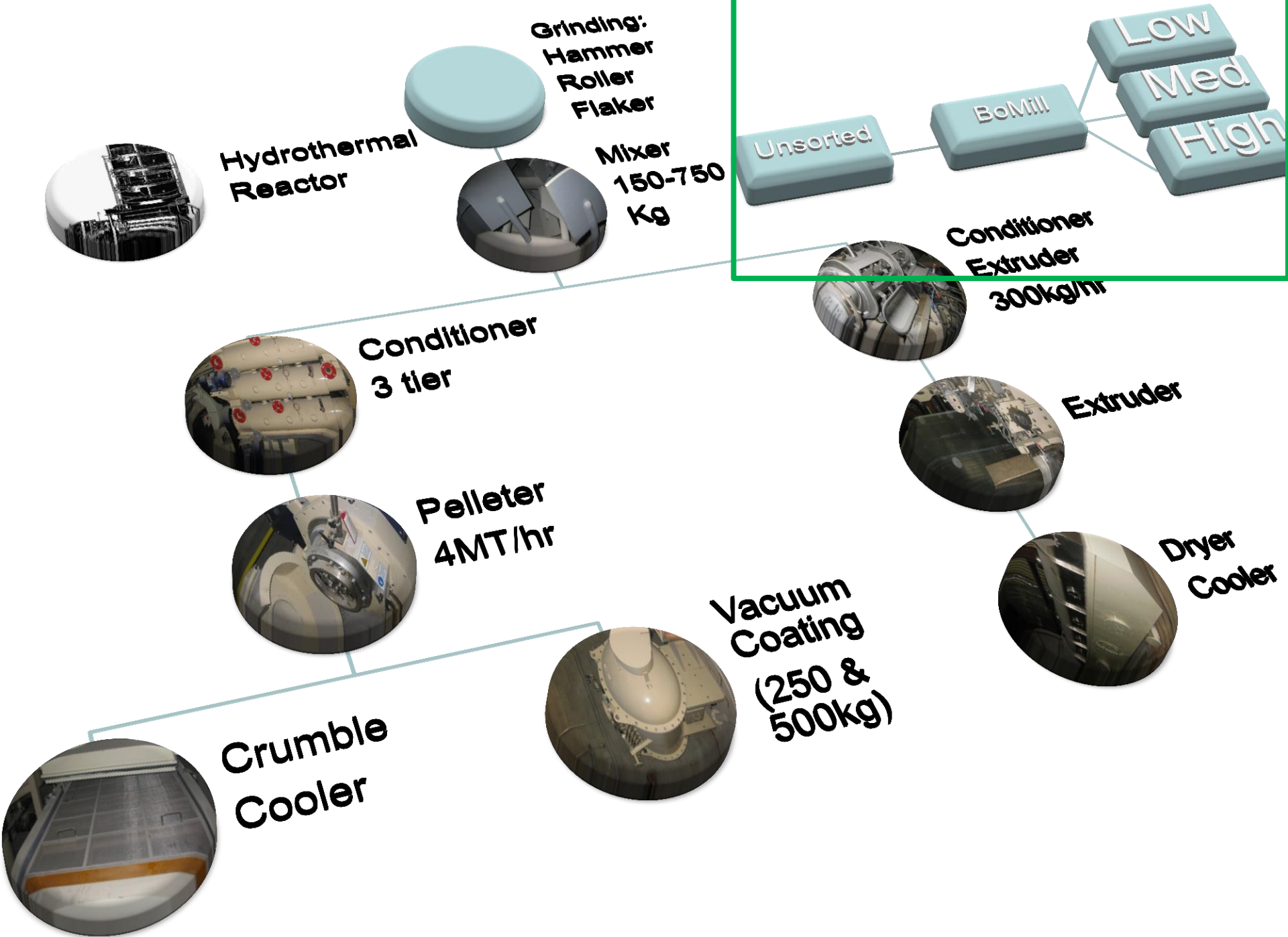
Processing

- Pooling / sorting
- Dehulling
- Grinding
- Mixing
- Pelleting
- Extrusion
- Specialty processing
 - Extraction
 - Fractionation
 - Micronization
 - Coating / Protected



Feed Value

- Feed = ~60 to 70% of Cost of Production
- Reflects the economic value:
 - Performance / Efficiency
 - Health and Wellbeing
 - Product Quality
 - Food Safety
 - Environmental Sustainability
 - Regulatory Compliance
- Feed processing is and will continue to be important in enabling the animal industry to convert low quality nutrient sources into high quality food in a safe and sustainable manner



Fine line between **moisture** / **heat** and starch
gelatinisation / slow release / retrogradation
(Starch Kinetics)

Fine line between **moisture** / **heat** and protein
Solubilisation / denaturation / by-pass

Fine line between **moisture** / **heat** and fibre
solubility (increased enzyme required;
probiotic; increased energy)

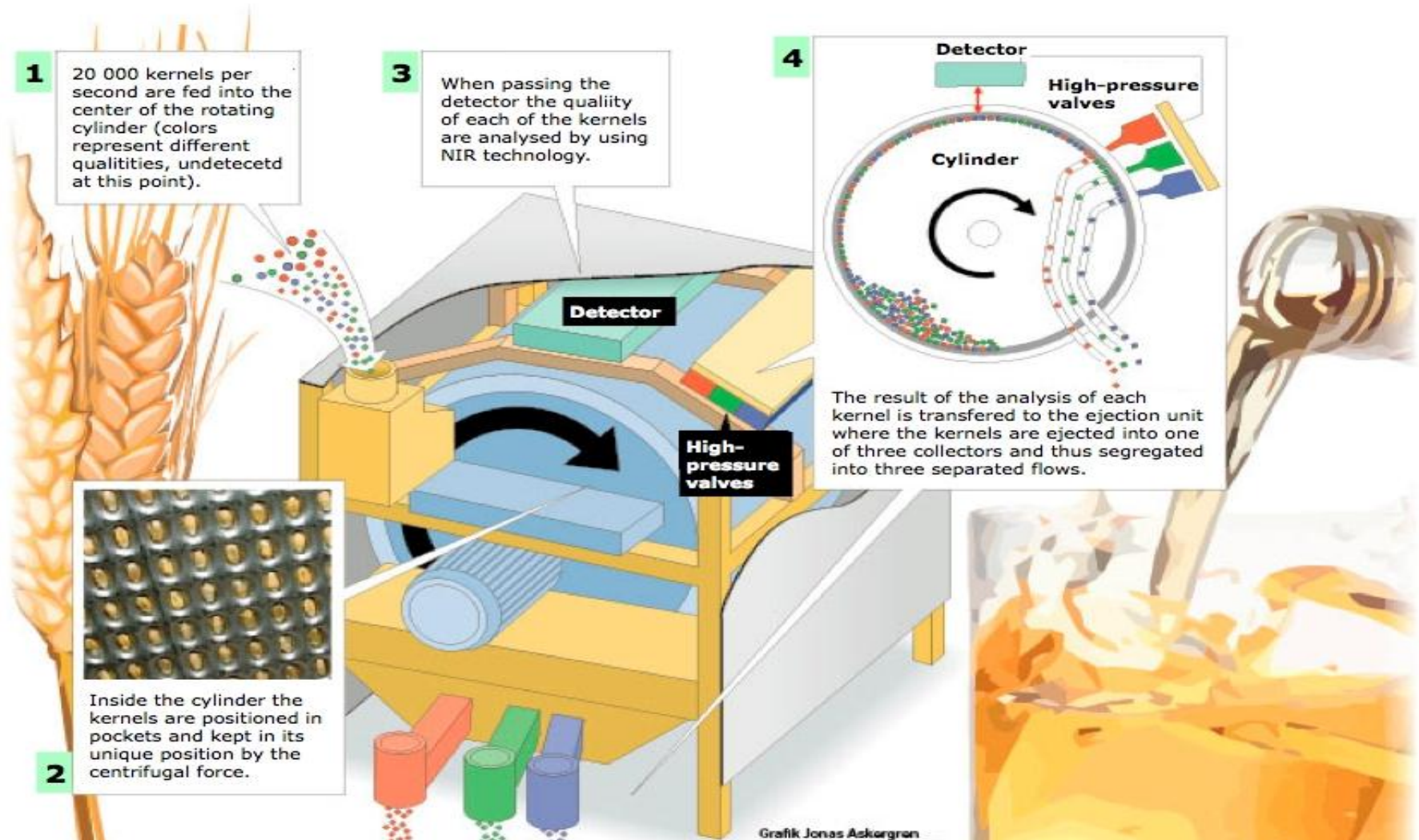
Fine line between processing / hydration / intake



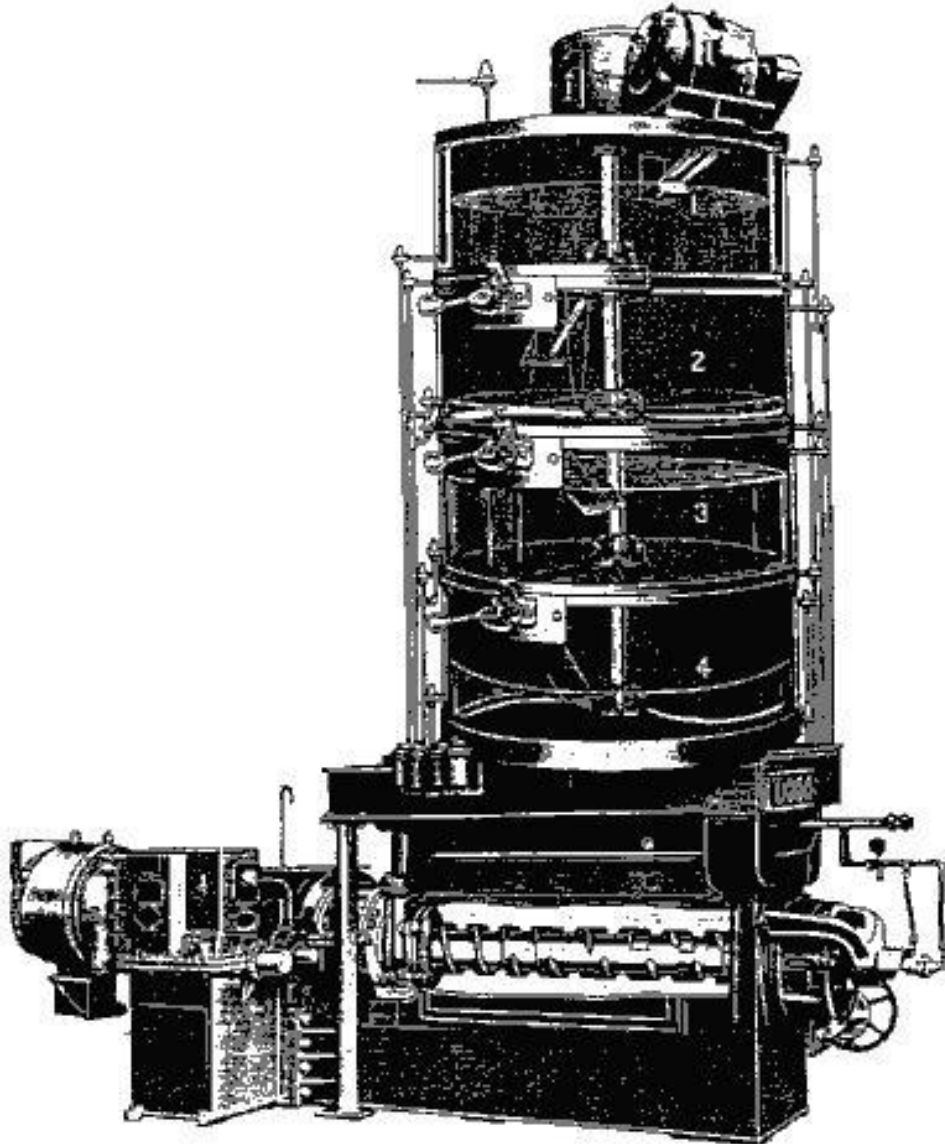
The effect of 30, 20 or 0% cooked cereal on pellet form after 10 minutes soaking in water

BoMill Seed Sorting

3 Fractions / 20,000 seeds/sec



Hydrothermal Reactor



- Conditioning/ Cooking
 - Temperature
 - Moisture
 - Time
- Enzymes
 - pH
 - Organic acids
 - Prebiotic
- Batch vs Continuous Flow Systems

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Thank you!
Questions?

Input Variation



Consistent
Feed



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