Breakfast 32,000 years ago

“Eat your porridge Alison, it doesn’t have gluten”
Product Innovation
Price vs Value

DEMAND: SUPPLY

establishes **PRICE**

where

**PRICE** = the cost at which anything is obtained
Value vs Price

**IF VALUE**

= the desirability of something,

then additional functionality makes a product desirable,

and that means selling the benefits and individuality of a product and stepping outside commodity price.
A dysfunctional value chain?
Stop selling milk

SELL WHITE WATER

- With added - energy
- With added - protein
- With added - calcium
- With added - vitamins
- With added - goodness
Oats in a value chain

A value chain approach embodies the shift from commodity production to producing products in an assured manner, to a specified quality, delivering additional functionality and benefits to the consumer.

Gluten free, Organic or Naked oats are value attracting markets.
Easily substituted on price

Animal feed

Volume

£ Value

Human Foods

Medical foods

Functional foods

Companion animals

Ruminants

Industrial

Cosmetic and body care

Unique properties

Pharmaceutical
Oats for health and nutrition

- Satiety
- Beta glucan
- Coeliac disease
- Diabetes

British Heart Foundation

senova
Oat Value Chain

- Nitrogen Manufactures
- Fertiliser Compounders
- Pesticide Manufactures
- Plant Breeders
- Machinery & Equipment Manufacturing
- Tractor Manufacturing
- Agriculture Contractors
- Fertiliser/Pesticide/Seed Distributors
- Seed Merchants
- Machinery Dealerships
- Farmers
- FSS
- Grain Marketers
- Oat Feed
- Animal Feed Manufacturers
- Oat Starch
- Flour
- Breakfast Manufacturer
- Mills
- Oat Starches
- Oat Oil
- Food Processors
- Bakeries
- Industrial Applications
- Pharmaceuticals
- Fine Chemicals
- Confectionary
- Body care
- Cosmetics
- Retailers
Where do we add value?

Product Innovation

- Quality (e.g. Oil, beta-glucan)
- Functional (e.g. kernel content)
- Agronomics (Disease, standing ability etc)
- Performance (Yields)

Base Line Value
Critical Factors

- Retain Crop Competitiveness – Yield : Price
- Disease Resistance – Crown Rust, Mildew
- Oat Mosaic Virus, Cyst Nematode, Fusarium

Desirable

- Winter hardiness
- Earliness
- Straw characters (PGRs)
- NUE – LCA (PEF)
In the market

Critical Factors
- Specific Weight – Genetic and Agronomy
- Kernel Content – Milling Yield
- Ease of Dehulling – Milling efficiency

Desirable
- Beta Glucan
- Avenanthramides
- Starch Modifications
Adding quality – Adding value?

4% beta-glucan (minimum)
78g or 3 bowls of oatmeal

6% beta-glucan (minimum)
52g or 2 bowls of oatmeal

8% beta-glucan (minimum)
39g or 1.5 bowls of oatmeal

Source: Nancy Aims  CRC Winnipeg
Anybody know who this is?
Global oat area shrinkage

2004 - 3.3 million ha
Global oat area shrinkage

2014 – 2.6 million ha
Oat area has halved in the last 20 years and is down from 7% of total crops in 1960 to 1.5% in 2007.
A market in decline is rarely attractive for investors.

Plant breeding demands sustained long term investment.

We continually appraise between volume and value.
Developing a new variety will cost ~ £2 million.

Presently some 20 active oat programmes in Europe

European oat royalty £22 million
Easily substituted on price

Volume vs Price

- Ruminants
- Companion animals
- Medical foods
- Functional foods
- Traditional foods

Unique properties

- Pharmedaceutical
Our dilemma

- In a diminishing or polarising market if we cannot increase our income then we must decrease investment or find new markets.

- New research on new varieties has highlighted that oats can deliver functional benefits in terms of performance, cost efficiency, and environmental gains when fed to ruminants, monogastrics and poultry.
A volume strategy would aim at feed rather than food market.

To increase volume, which requires more acres to be produced, which means more seed to be used, which will sustain our investment.
Revitalise feed market

ENDEVOR

Development and application of novel de-hulling technology and stabilisation technology to enhance the value of oats as a sustainable feed for ruminants and monogastrics.

Oat breeders Aberystwyth University are working with industry partners, co-funded by Innovate UK, to energise oats for ruminant nutrition and to explore new industrial opportunities from the bio-processing of oat hulls.

Energising oats for ruminant nutrition

Employing novel de-hulling technology, the objective of this innovative project is to provide:
- the feed industry with a cost effective high nutrient dense grain
- the bio-processing industry with oat hulls for bio-refining

Based on the use of new unique high ME and low fibre oat varieties such as HiDiCat™, the commercial aim is to re-establish oats as a viable option for inclusion in ruminant and monogastric feeds.

The project began late 2014 and runs until 2017.

More information on the project can be found at www.oatfeed.uk
Oat Brand Enhancement

Oatlay®

HiDiOat®

Equavena®
## Mitigation Strategy

<table>
<thead>
<tr>
<th>Challenge</th>
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<tbody>
<tr>
<td>Harness new technologies (di-haploids)</td>
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<tr>
<td>Greater understanding of crop physiology</td>
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<tr>
<td>Improved knowledge transfer</td>
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<tr>
<td>Benchmarking</td>
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<tr>
<td>Promote biodiversity</td>
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<td>Contracts</td>
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## Challenges – Diminishing markets

### Mitigation Strategy

<table>
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<th>Action</th>
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<tbody>
<tr>
<td>Strengthen spring oat programme</td>
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<tr>
<td>Revitalise old markets - feed</td>
</tr>
<tr>
<td>Explore new markets – AD : Overseas aid</td>
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<tr>
<td>Prospect new territories – NA, SA, EE</td>
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<tr>
<td>Refine breeding targets (spring : winter)</td>
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<tr>
<td>Meaningful Alliance (tactical, strategic)</td>
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<tr>
<td>Sharing resources (skills)</td>
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<tr>
<td>Mitigation Strategy</td>
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<td>-----------------------------------------------------------------------------------</td>
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<tr>
<td>Adaptive and appropriate IP modules (hybrids?)</td>
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<tr>
<td>Value streams – short chain production</td>
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<tr>
<td>Rebuild economic models (PEF / LCA)</td>
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<td>Attract inward investment – public, private</td>
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<td>Contract breeding</td>
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<tr>
<td>Enhance brand equity (oatlay, avenola)</td>
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Bridging the knowledge gap

Value integration
Need to get our message across

Did you know?

- Gluten is a protein that is found in some cereal grains - most commonly wheat, rye, barley and oats.
- Some people are intolerant to gluten and feel better when they avoid it. Others simply enjoy...
  ...the gluten free lifestyle.

Nestlé Gluten Free HONEY flakes
Defend our OAT brand
Naked Oats

A commercial dilemma
Humanitarian aid
“Through innovation, knowledge and collaboration improve the value and uptake of oats”.

Oat goal
Contact

Chris Green

chris.green@senova.uk.com
www.senova.uk.com

On humanitarian food aid contact

chris@oatinnovations.com
Perhaps we are spoiled for choice

Husked Oats

- field
- 30% waste
- 30% waste
- time and energy intensive
- 60% consumer 40% waste hulls screenings

Naked Oats

- hulls remain in field
- 10% waste
- 10% waste
- less energy, less time
- 85% consumer 15% waste hulls screenings
Oats – a crop in decline?

Global
1960 = 56 million tonnes
2014 = 23 million tonnes

Europe
2004 = 3.3 million hectares
2014 = 2.6 million hectares
Plant breeding
- harnessing resources and knowledge to deliver improvements

- Improve growing cost efficiency
  – main benefit is with the grower

- Quality & market attributes benefit the processor or end user
BBSRC - InnovOat

InnovOat
Developing enhanced breeding methodologies for oats for human health and nutrition

Increasing genetic diversity
Global outreach for novel oats

Milling efficiency
Milling yield is critical. Novel lines to be fast tracked for commercial assessment.

Oats health, nutrition and wellbeing
New varieties to increase consumption and stimulate product innovation

Phenotyping
Investigation into interactions (genetics-environment-inputs)

Metabolic profiling
Modelling and characterisation of desirable quality characters

Genetic prediction of breeding value
High throughput genetic sequencing

InnovOat is a five year project funded through the BBSRC Stand Alone LINK Scheme. It includes Aberystwyth University, NIAB, Heriot Watt University with Industrial Support from Senova and the BOOMA Research Group (PepsiCo, Morning Foods, Hamleys, Whites Speedcook and Hogarths).

More information on the project can be found at www.innovoat.uk
Naked oats are in effect a natural groat

- Harvested without the hull.
- No dehulling or costly processing.
- Less waste, transport, and storage.
- High oil, high protein.

But no market champion..
Needs new value chain and route to market.
A value chain approach embodies the shift from commodity production to producing products in an assured manner, to a specified quality, delivering additional functionality and benefits to the consumer. Gluten free, Organic or Naked oats are value attracting markets.