DEVENISH™
Beyond Nutrition

“One Health.....from Soil to Society”
Innovative Livestock Solutions, for Human & Environmental Health

Dr John Gilliland OBE
Director of Agriculture & Sustainability
Project Leader, The Lands at Dowth
Devenish – A Knowledge based, Global Farming System’s Company Delivering Innovative Solutions to Improve Animal, Human & Environmental Health, Simultaneously

North America, Manufacturing & Research Facilities
UK & Ireland, Home, Market, Manufacturing & Research Facilities
Devenish Nutrition International, Markets
What makes Devenish Unique

- **Investment in People** - 36 PhD Graduates aiding the Innovation Engine

- **Industry Knowledge** - Most employees have Industry background

- **Evidence Based Science** - 20% of Turnover invested in R&D, validated though Devenish’s unique “Performance House” Concept System

- **Partnerships** - Delivering Sustained Innovation & Performance Improvement along the Supply Chain
Devenish’s Global Outreach on a Weekly Basis

94 million → 375 million

200,000 → 100 million

Before we talk about our Ruminant business…..
“One Health”

…From Soil to Society
“One Health” from Soil to Society

E.g. Improving Human Health with Chicken, enriched with “Marine” Omega 3

Adding Value “Pre Farm Gate,” with unique Human “Bio Availability,” delivering rapid Human Health Improvement (within the 1st week!!!)

You are what you eat, Eats!!!
One Health….. from Soil to Society
E.g. Improving Cow Welfare & Environment, through Improving Soils
Food today ..... is not always as Nutritious it could be & diet-related Diseases are Increasing

Turn Around Fellas, We Got it All Wrong!!
Changes in Nutrient Content of Vegetables & Fruit over time

US study of nutritional data from both 1950 & 1999 for 43 different vegetables & fruits, found statistically significant declines in the amount of:

- Protein ↓ 6%
- Calcium ↓ 16%
- Phosphorus ↓ 16%
- Iron ↓ 15%
- Riboflavin ↓ 38%
- Vitamin C ↓ 20%
Changes in Nutrient content of Wheat over last 160 years

Fan et al. J.Trace Elements in Medicine & Biology 2008
Changes in the Nutrient Content of Oily Fish in the last ten Years

Levels of EPA+DHA (g/100g) in farmed Scottish Atlantic salmon between 2006 - 2015

Challenges in Developing Bio-enriched Food, via Livestock Feed

- Required levels of enrichment in food, after cooking
- Source of nutrient & inclusion level in feed
- Timing of inclusion
- Within flock/ herd variability
- Portion variability
- Eating quality & shelf life
- Animal performance & welfare
Choosing an Enrichment
Global Blood Levels of EPA & DHA Omega 3 fatty acids, in Adults

K.D. Stark et al. 2016
What are the Key Omega 3 fatty acids or PUFFAs?
ALA derived from Plants, EPA & DHA derived from Marine Sources

- **C18:3**
- **ALA**

- **C20:5**
- **EPA**

- **C22:6**
- **DHA**
Recommend 250mg EPA + DHA Intake Per Day

UK’s Current Daily Intake????

Not enough!
Being able to Quantify the Scale of the Positive Impact
Omega 3 Index – An Internationally recognised Index of Cardiovascular Disease Risk

Omega 3 Index (EPA and DHA IN RBC)

Low Risk: 12%
High Risk: 8%

UK Mean for Adults 3.68%
UK Mean for Children 2.46%
Being able to Validate the Positive Impact Credibly
Randomised Double Blind Control Human Trial

Effects of 6 months of eating on 160 people:
- Omega-3 enriched chicken-meat *versus* control chicken meat.
- Omega-3 enriched eggs *versus* control eggs.

<table>
<thead>
<tr>
<th>Chicken-meat</th>
<th>Eggs</th>
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<tbody>
<tr>
<td>&gt;3 Portions Control Chicken-meat/Week (n=80)</td>
<td>&gt;3 Control Eggs/Week (n=40)</td>
</tr>
<tr>
<td>&gt;3 Portions Omega-3-PUFA Enriched Chicken-meat/Week (n=80)</td>
<td>&gt;3 Omega-3-PUFA Enriched Eggs/Week (n=40)</td>
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Explaining the Results using the Omega 3 Index

Number of people with High Risk Omega-3 Index was Halved by Eating Both Omega-3 Chicken & Eggs

Control Chicken and Control Eggs
- High Risk: 67.6
- Medium Risk: 32.4
- Low Risk: 0

Omega 3 Chicken and Omega 3 Eggs
- High Risk: 34.4
- Medium Risk: 3.1
- Low Risk: 0
As a Result…. 

June 2016, Waitrose launches World’s first, Naturally enriched Chicken Meat

Nov 2017, American Heart Association awards Research, best International Paper

You are what you eat, Eats!!!
Other Bio-enrichments?? Other Animal Species??

Daily Vitamin D Intake (µg/day) for European Adults

- Male Adult
- Female Adult
- Male Elderly (>64)
- Female Elderly (>64)

Not enough!

Spiro & Buttriss British Nutrition Foundation 2014
So What about Improving Environmental Health?
The Devenish Lands at Dowth

170 ha Grass & Woodland Farm
A Ruminant Landscape Performance House
Lands at Dowth, Bru na Boinne, UNESCO World Heritage Site

Lands of Dowth - 22% of World Heritage Site
13 Monuments – 6 with Statutory Protection
The Lands at Dowth
Creating a Robust, Scientific Base Line to aid Future Management Decisions

Surveys carried out since 2014
Aerial LiDAR; Geophysics by Romano Germanic Commission; GPS Soil Analysis, overseen School of Archaeology, UCD, & Devenish
Initially, Using LiDAR to find new Archaeological Landscape features
Subsequently, to aid Credible Land Management Decisions

(S. Davis, UCD. 2014)
The Lands at Dowth – GPS Soil Analysis

Initially, using GPS Soil Sampling to aid Phosphate Management
Subsequently, to find Archaeology

(P. Ward 2014)