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Teagasc Webinar

Poultry Nutrition
Time to Take Stock

16th December 2020

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One Health, From Soil to Society

FROM SOIL TO SOCIETY One HEALTH DEVENISH Beyond Nutrition SUSTAINABLE FOOD

Producer

Processor

Retailer

Consumer

Human & Environment Health

= Nutrient Optimisation

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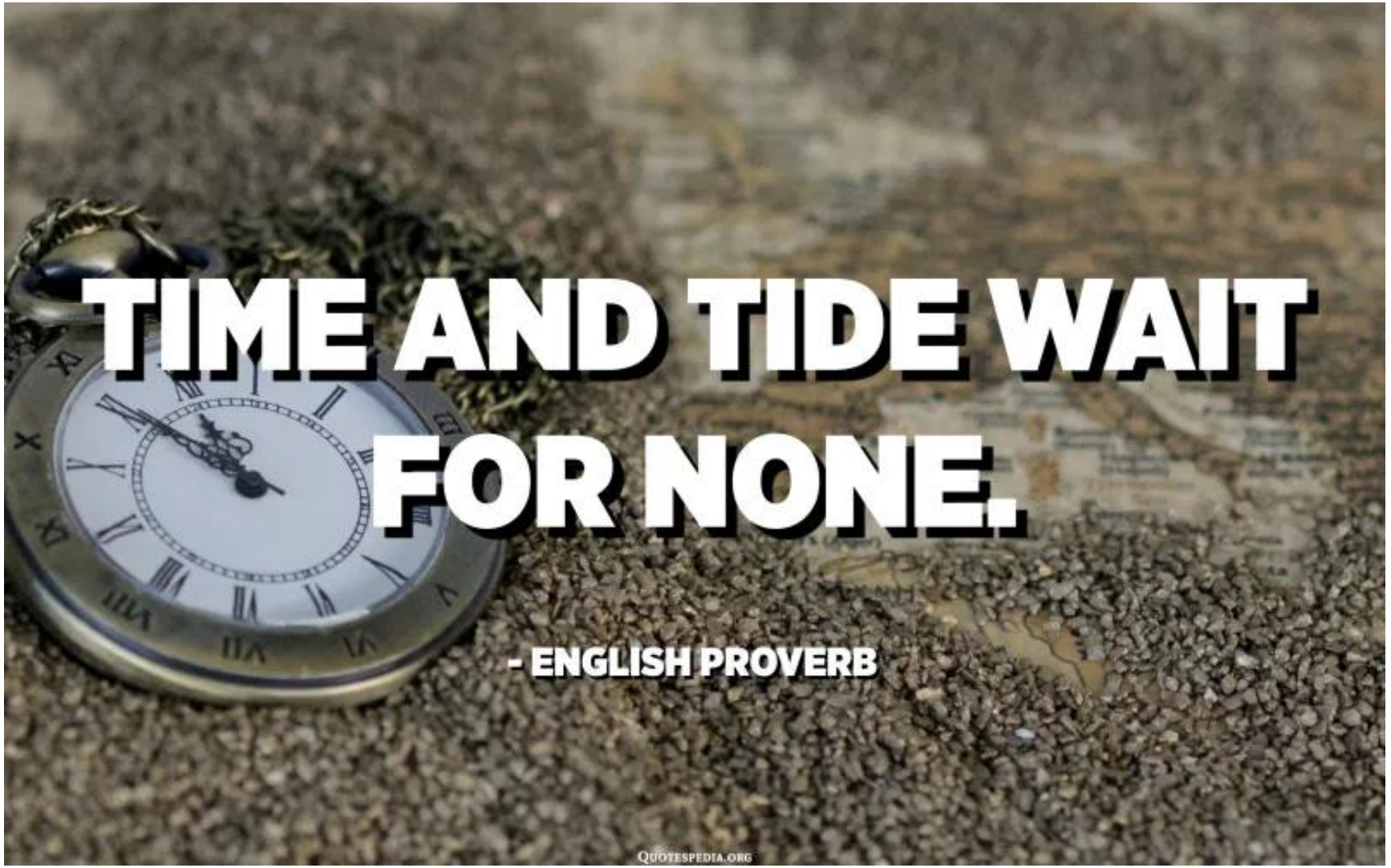

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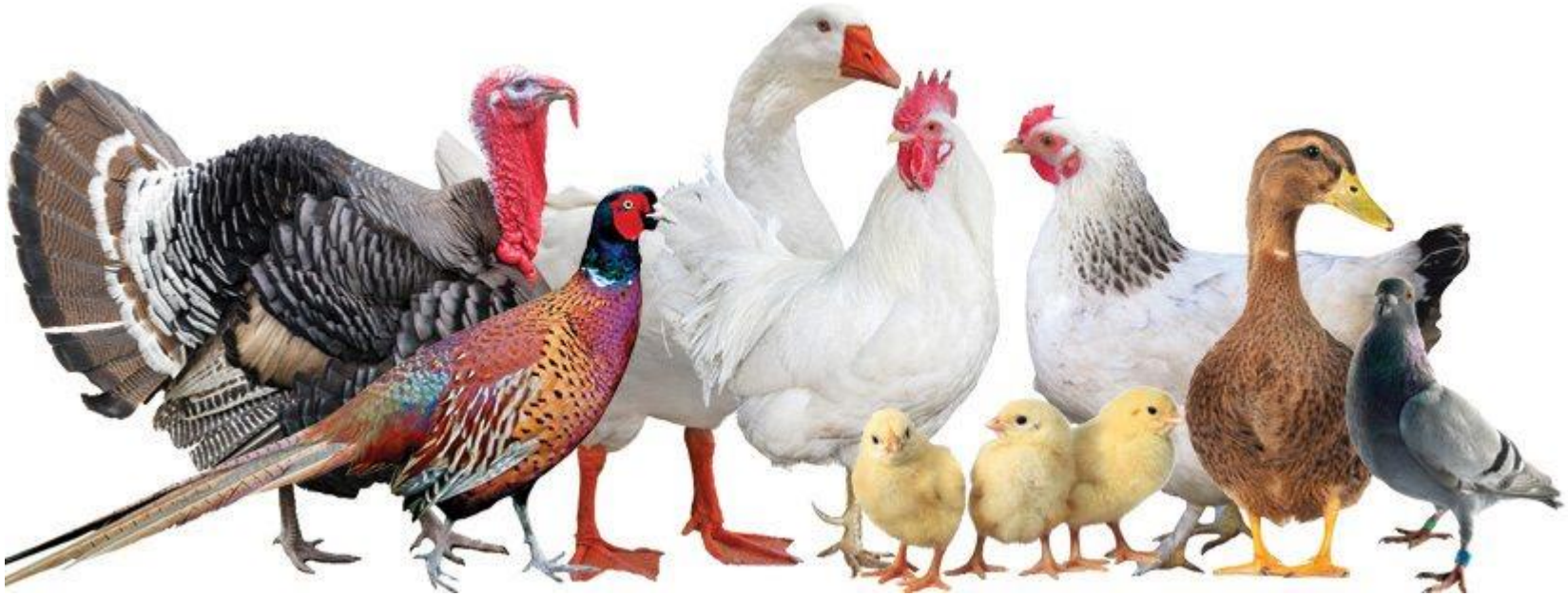
Nutrition-The Present and The Future



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The Future- The Progeny

EMBRYO

✓39% of lifespan = 2020

✓44% of lifespan = 2030

✓~15% increase in time !! Very significant

✓Critical to Feed our Breeder to Feed our Embryo

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Nutrition- Never in Isolation

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Nutrition

Health

Genetics

Raw materials

Management

Environment

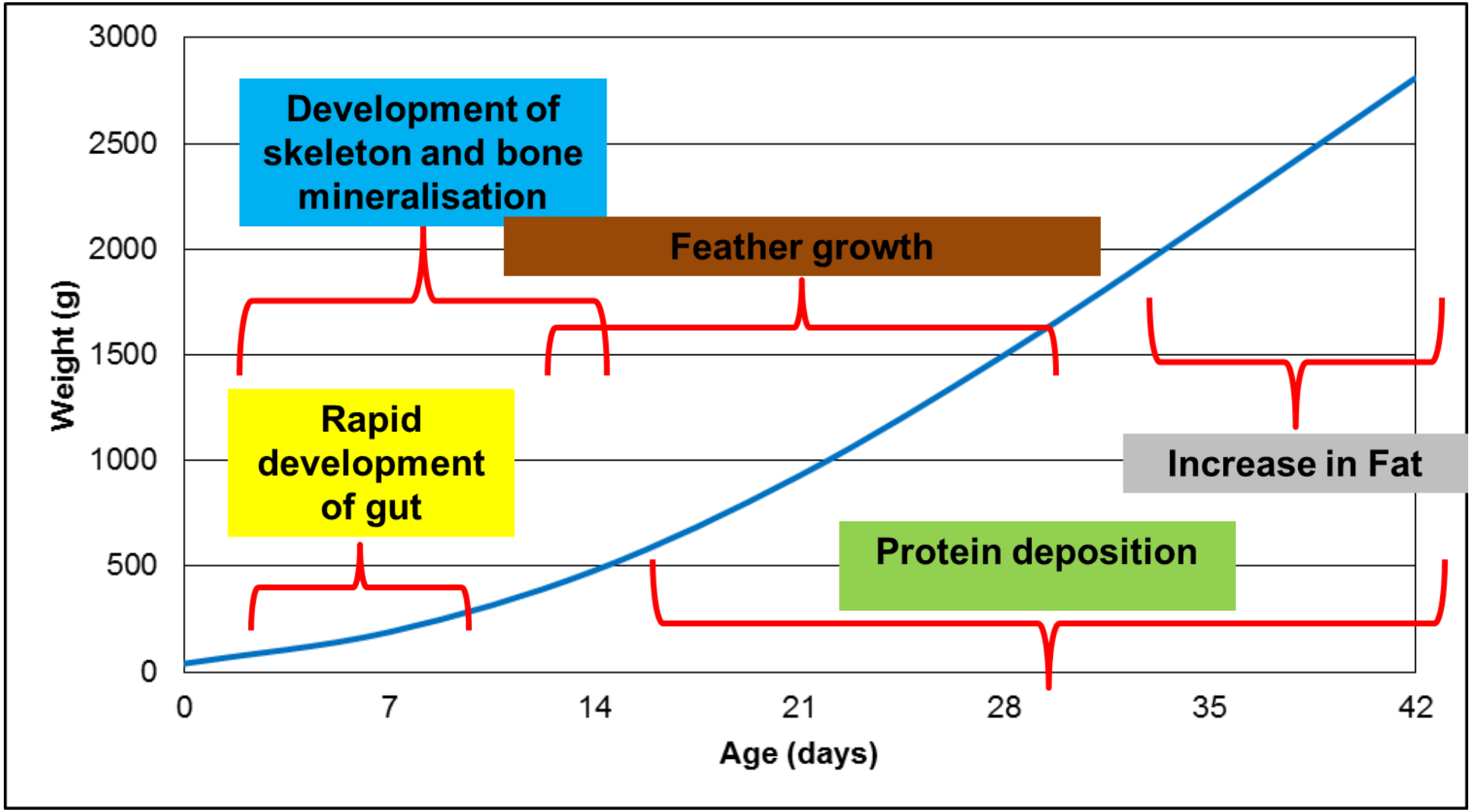
Nutrition Objectives

- To supply a range of balanced diets which satisfy the nutrient requirements of all poultry at all stages of their development and production
- To optimise efficiency and profitability
- To ensure bird welfare is not compromised

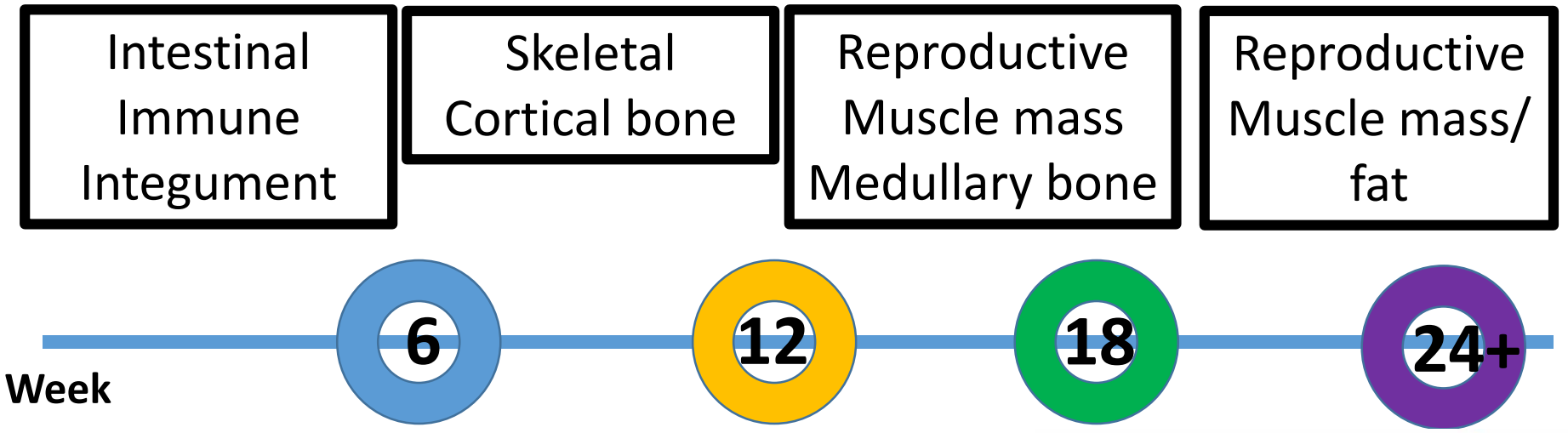
Nutrition Principles

- Feed =60 to 70% of total costs of poultry production
- Diets- **correct balance** of nutrients for optimum growth and performance
- Management factors may alter FI, LWG and FCR
- **Daily feed intake** of nutrients that matters

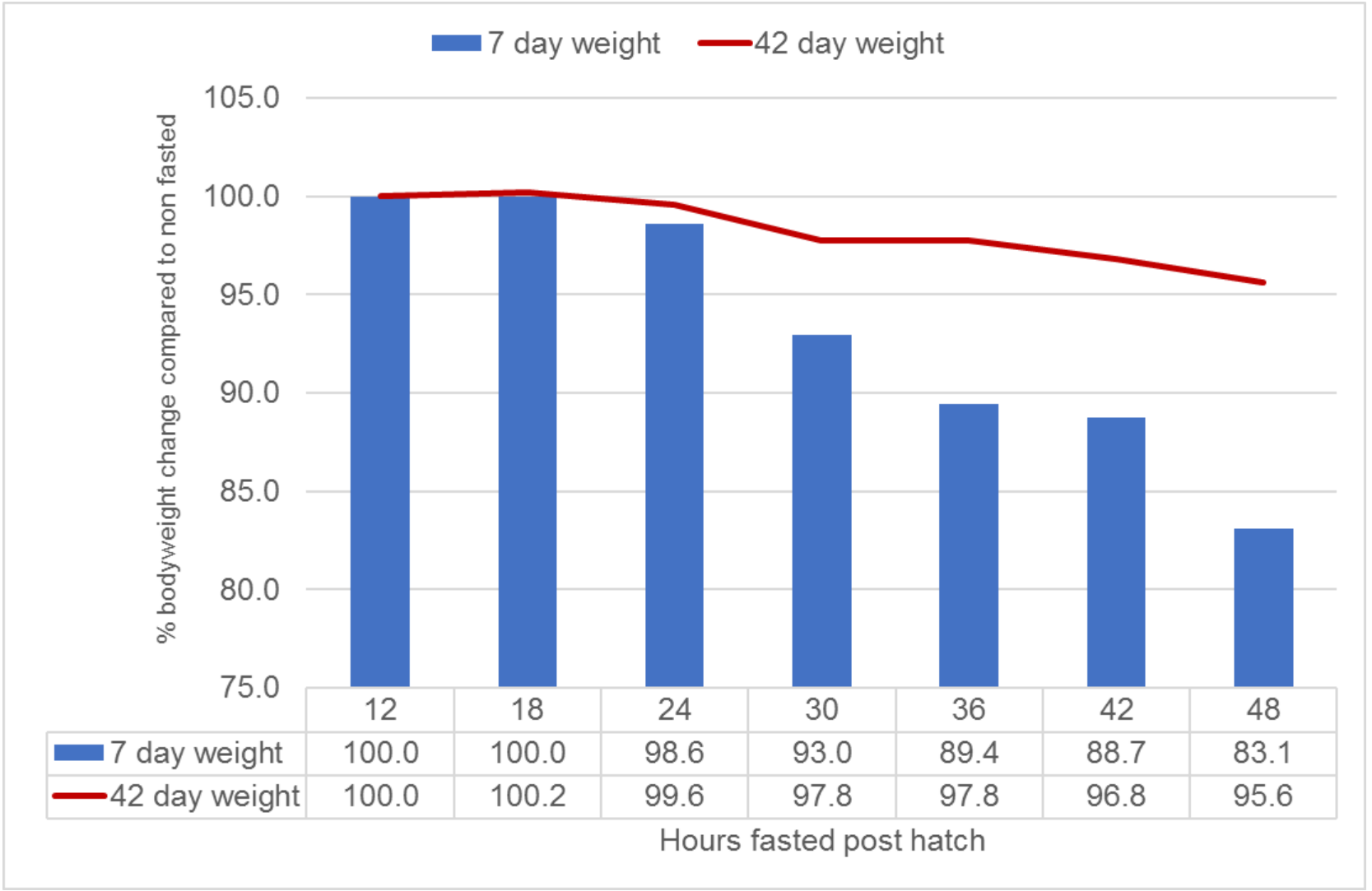
Broiler Growth Curve



Laying hen development phases



Importance of early intake



	12	18	24	30	36	42	48
7 day weight	100.0	100.0	98.6	93.0	89.4	88.7	83.1
42 day weight	100.0	100.2	99.6	97.8	97.8	96.8	95.6

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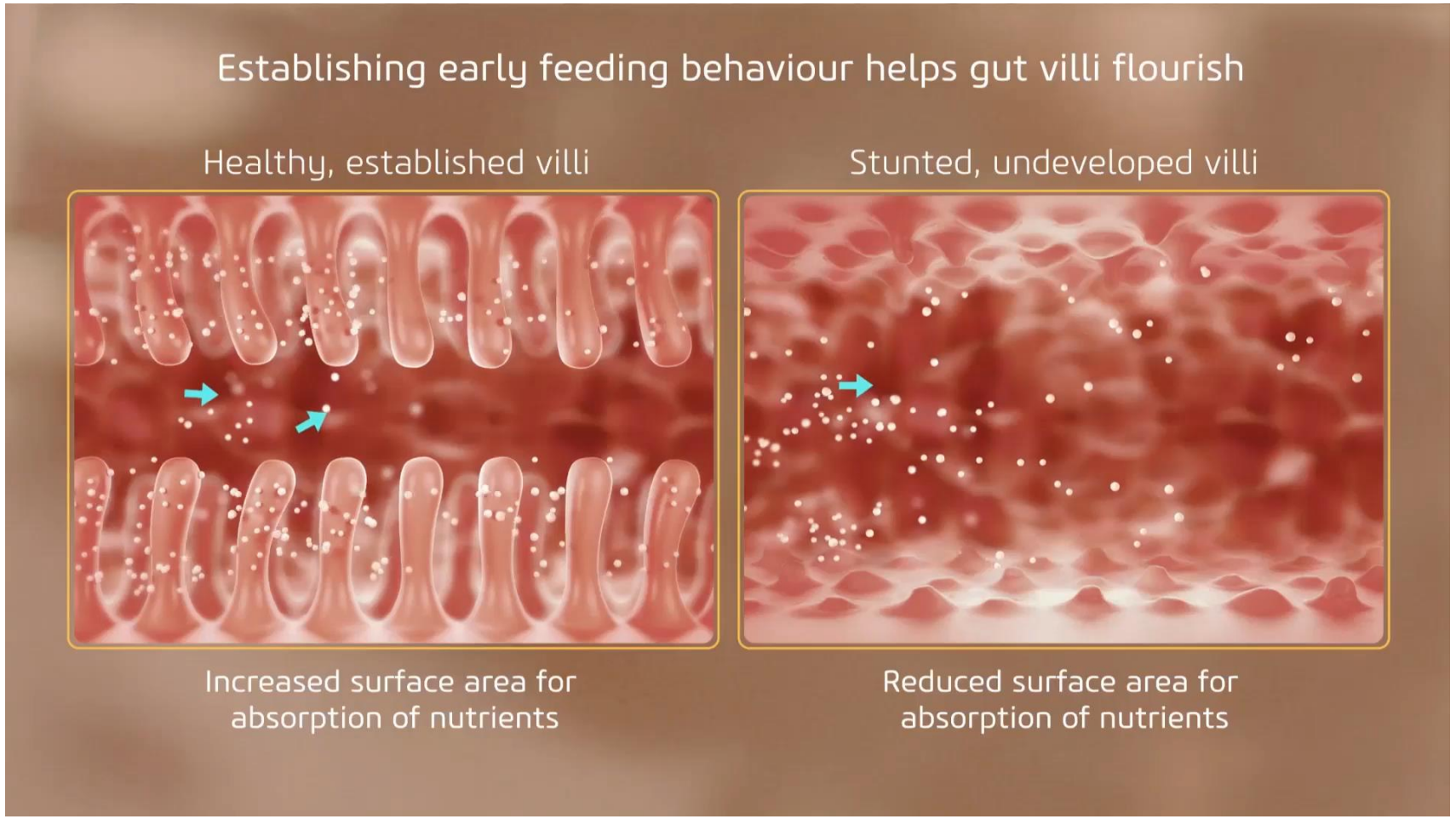

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Water 2:1 Rule

- 24 hours per day
- Water quality: bacterial, high minerals, temperature, hardness
- Insufficient volume or access= reduced performance
- Close relationship between feed and water intake
- Watch-Sudden increases/decreases in water demand or ratio deviation
    - Environmental Stress
    - Disease (viral or bacterial)
    - Variation in feed quality

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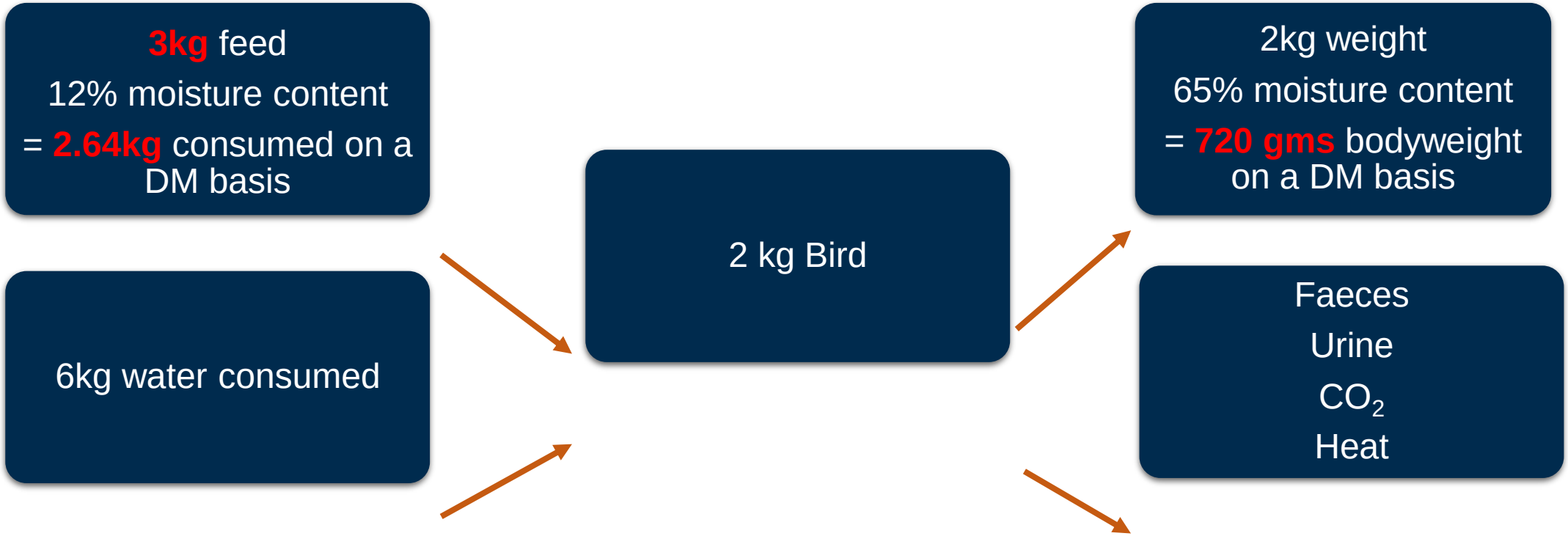

Every 1 kg of feed consumed delivers 0.24kg of bodyweight
Only 24% of the feed consumed is converted to bodyweight

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Diets

NUTRIENTS	INGREDIENTS
Energy	Wheat
Oil	Hipro soya
Protein	Rapeseed/Distillers meal
Amino acids	Soya oil
Fibre	Maize
Minerals	Premix
Vitamins	Enzymes

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Energy

- **Main sources:** Cereals (Carbohydrates)

  Vegetable Oils & Oilseeds

- **Role:** metabolism, organ development and maintenance and growth

- **Under supply:** body weight decrease, birds will try to compensate by eating more and giving higher FCR

- **Over supply:** may lead to poor litter and scouring if energy is in excess of birds requirements

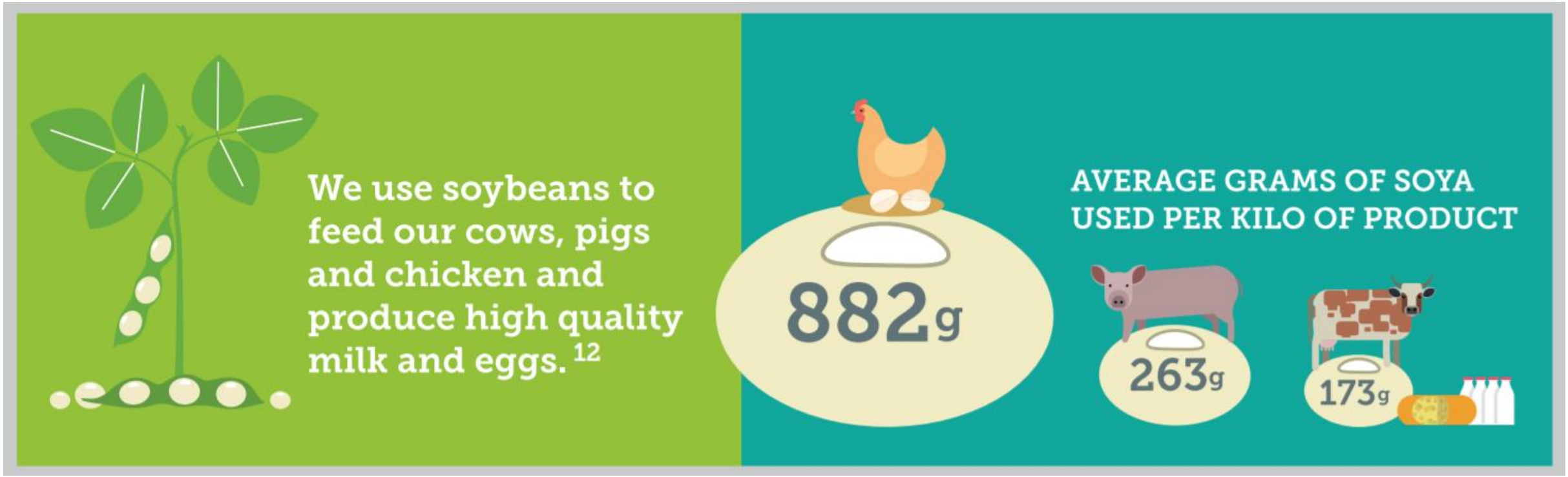
ENZYMES NSP and Phytase

- Some nutrients bound within vegetable part of diet –can be relatively indigestible- not readily available to birds
- Fibre fraction of Wheat (NSP)
- Phytate phosphorus of cereals
- Enzymes- compliments the bird's own systems to break down these compounds and improve digestibility and availibility

Protein

- **Main sources**: Hipro Soya, Rapeseed, DDGS, Amino Acids
- **Role**: supply of amino acids at cellular level body maintenance and growth breast muscle development
- **Under supply**: reduced growth, poor feathering, etc…
- **Over supply**: metabolic stress, energy imbalance, poor growth, nutrients for bad bacteria, scouring and wet litter

Soya – how sustainable?



Credit: EuropaBio

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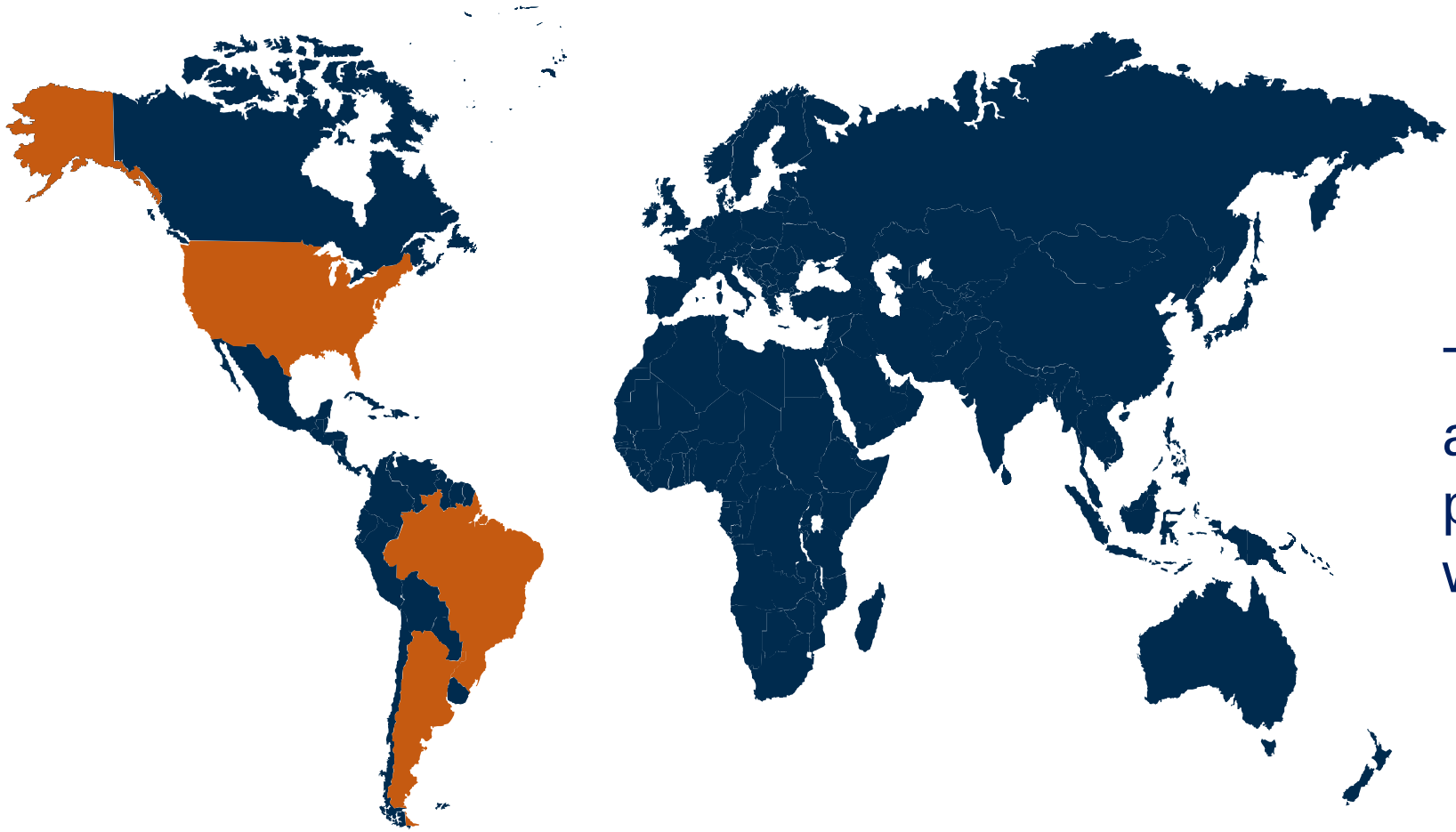
Soya – how sustainable?



80%

The United States, Brazil, and Argentina together produce about 80% of the world's soy.

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Soya – how sustainable?

Growing demand
for soya

Competition for land

Deforestation

Cultivation of
High Nature Value land

Release of GHGs
via land use change

Soil erosion

Habitat loss

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Soya – how sustainable?

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Carbon Footprint by Species

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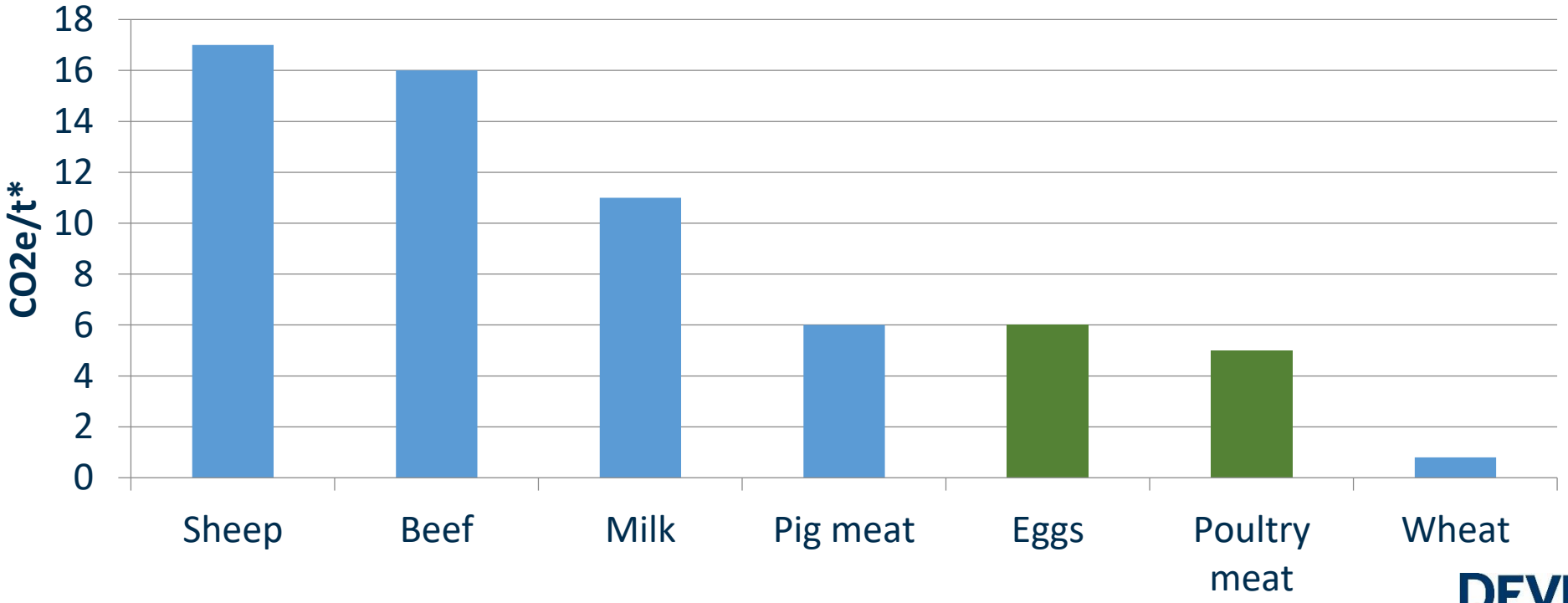
CO2e/t*



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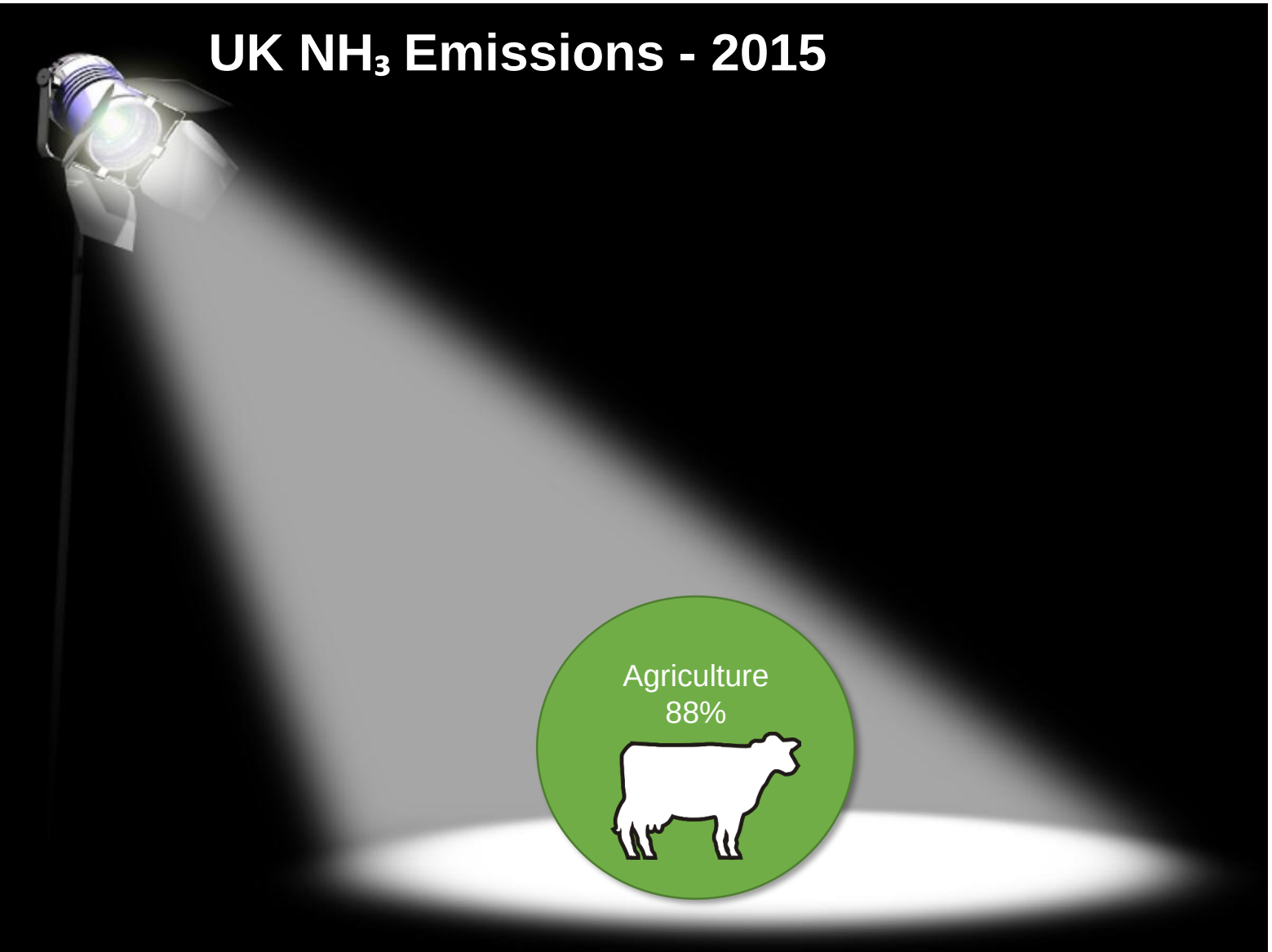
Ammonia – Emissions from Agriculture



NH_3 from **agriculture**

- Ireland = 98%
- NI = 91%
- UK = 88%
- EU average = 94%

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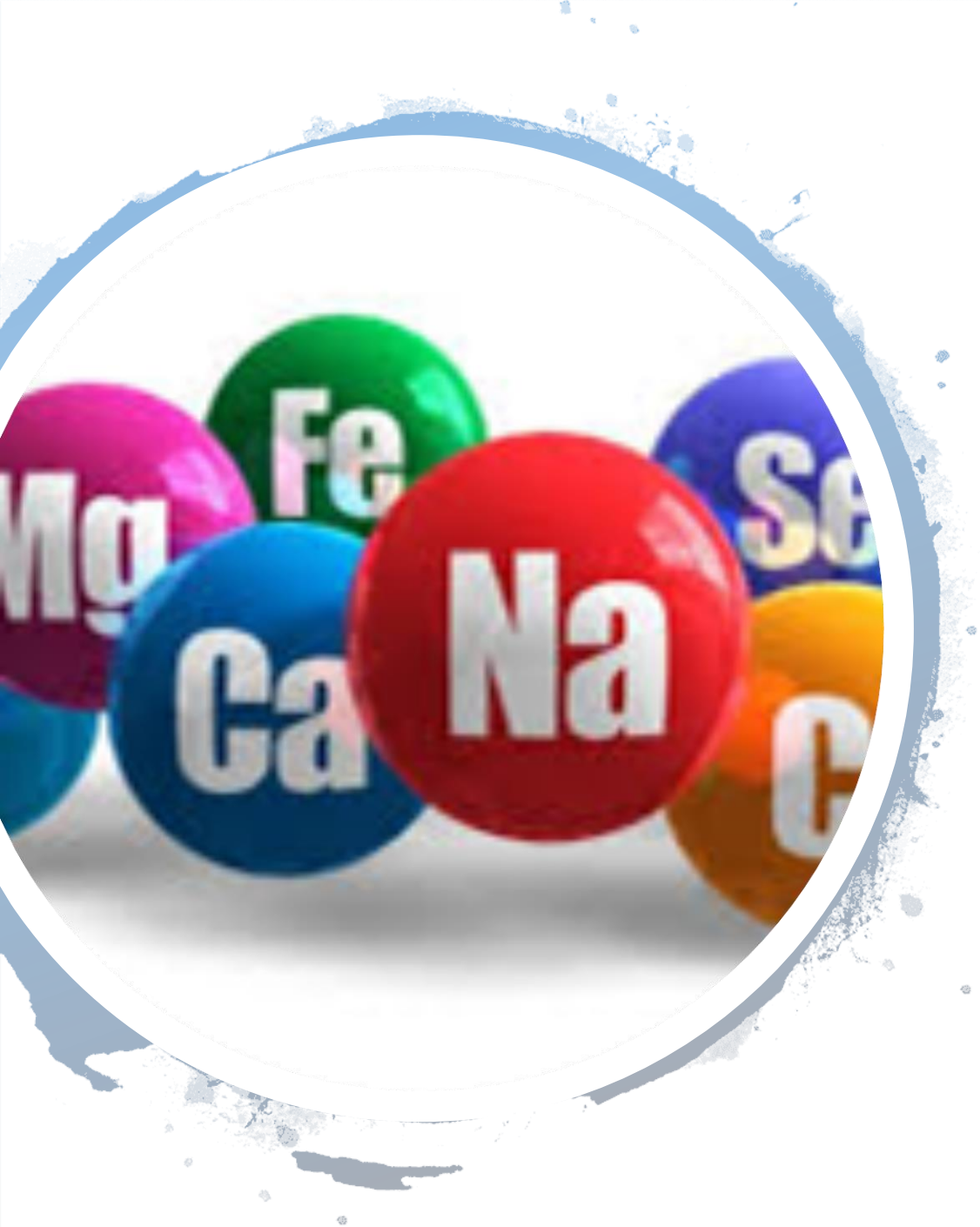
Macro Minerals Calcium & Phosphorus

- **Main sources:** Limestone, Phosphates & Cereals etc…..
- **Role:** Maintenance of Ca and P balance
  Bone and leg strength
  Enzyme reactions & energy metabolism
  Nerve impulses, muscle control
- **Under supply:** soft bones, impaired mobility, reduced growth
- **Over supply:** Reduced availability of other nutrient and subsequent other mineral/vitamin related issues



Trace Elements

- **Main sources:** Mineral & Vitamin Supplement (Premix)
- **Role:** support general health, immune function, catalytic function, metabolic process, normal growth, electrolyte balance……..
- Manganese, Zinc, Iron, Copper, Cobalt, Iodine, Selenium, Molybdenum……
- Low level addition (grams) – Premix addition

Vitamins

- **Main sources:** Mineral & Vitamin Supplement (Premix)
- **Role:** Antioxidants, immune system, metabolic support
- **Requirement:** required in small amounts, dependent on cereal type, fat type and level, stressors, disease etc.…
- **Under supply:** leads to problems with general growth, appetite, disease resistance, feathering, bone deformities, leg strength, skin abnormalities.
- A, D_3, E, K, B_1, B_2, B_6, B_{12}, Niacin, Pantothenic acid, Biotin

Ingredients- Size does not matter !

Soya

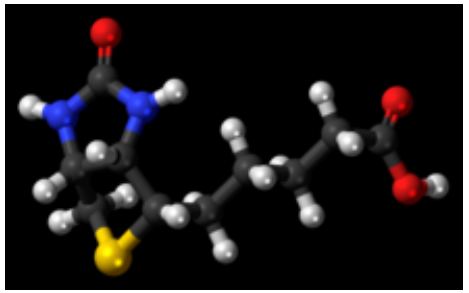
25% inc = 250kg/ tonne feed

= 1 in 4

Biotin

25mg/ inc = 25 mg/ tonne feed

= 1 in 40 million



Zinc

80 g/inc = 80 g/ tonne feed

= 1 in 12,500

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The power of the analytical chemist

1 picogram/gram

1 second in 37,000 years

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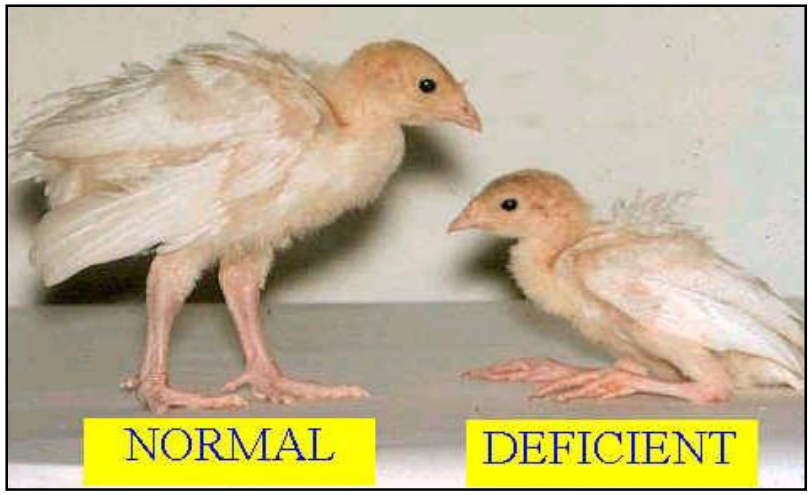

Vitamin D3 deficiency

Rubbery bone

Poor feathering

Vitamin B1 deficiency

Loss of nervous control

Concorde position

Biotin deficiency

Bad feet

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Vitamin A deficiency

Eyes and beak

Lysine deficiency

Blanched feathers

No breast meat

Vit E and Selenium deficiency

Muscle integrity

Susceptible to infection

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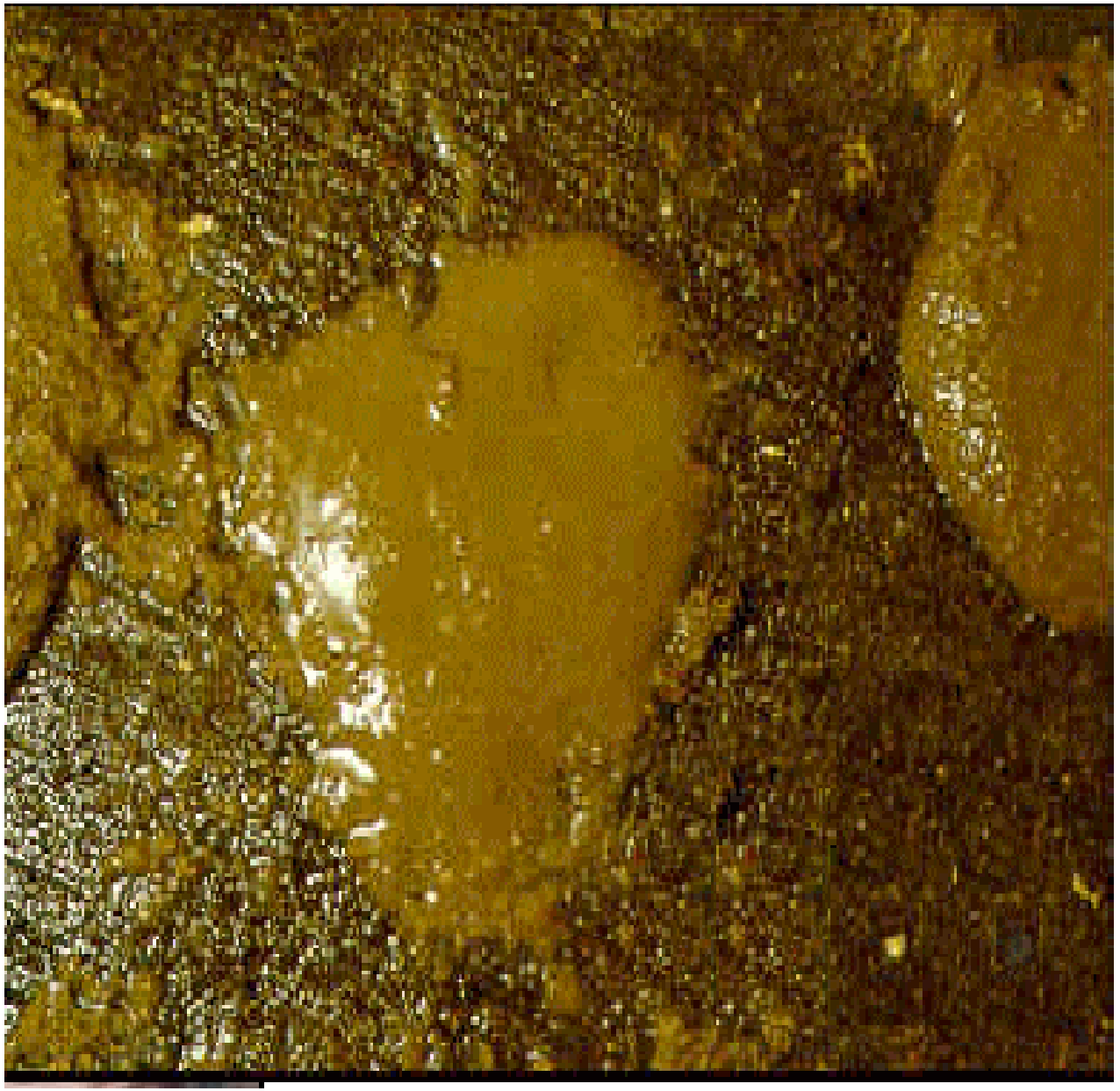
Digestive Scours



Coccidiosis

- Birds often scour
- Blood often seen in faeces
- Damage to gut lining
- Allows secondary infection
- Nutrients not absorbed
- Performance issues
- Easily controlled
- In feed coccidiostats or vaccinations

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Continuously Review

- **Environmental changes** – e.g. improved biosecurity, disease status, management input, climate change
- **Genetic changes** – continually changing
  Genetic selection emphasis in favour of bird welfare and meat quality rather than growth and efficiency
- **Alternative raw materials** – cost effectiveness/availability

Summary

Nutrition and diet formulation only a contributing factor to successful bird performance

Other factors include: farm management, biosecurity, environment, health/veterinary

These all impact on nutritional requirements

Diet formulation and feed manufacture is complex and considers many aspects of bird and production requirements

Has to firstly meet bird and production requirements and be cost effective

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Petrol

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Thank You !!

"I was told to keep my presentation interesting.
How do you program a projector to explode?"

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