INSIGHTS INTO EUROPEAN PET FOOD TRENDS AND INNOVATION

PETFOOD FORUM EUROPE

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Co-located with

Interzoo 2024

The future of the insect protein industry: Lessons learned from mature animal productions

Chloé Champion

PETFOOD FORUM EUROPE

Agronutris
Raise and rise together

Chloé Champion

- I Celebrated 20 years in the pet industry last April
- I chose the insect industry because I believe we need to do more with less
- I chose Agronutris because I wanted to be part of its journey of shared governance built on freedom and trust

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Agronutris
Raise and rise together

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AGRONUTRIS

From an idea to a Factory

Agronutris, scale-up ready pioneer of insect-based products

12 Years of insect farming and R&D

1st European company granted with **Novel Food** for insect meal

100 m€ raised via public & private funding

bpifrance — *French sovereign fund*

mirova — *Leading impact fund*

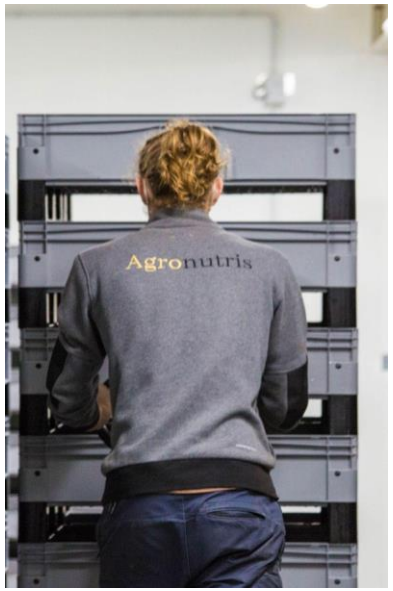
2 **BSF protein & oil** to support the **sustainable** growth of the pet food industry

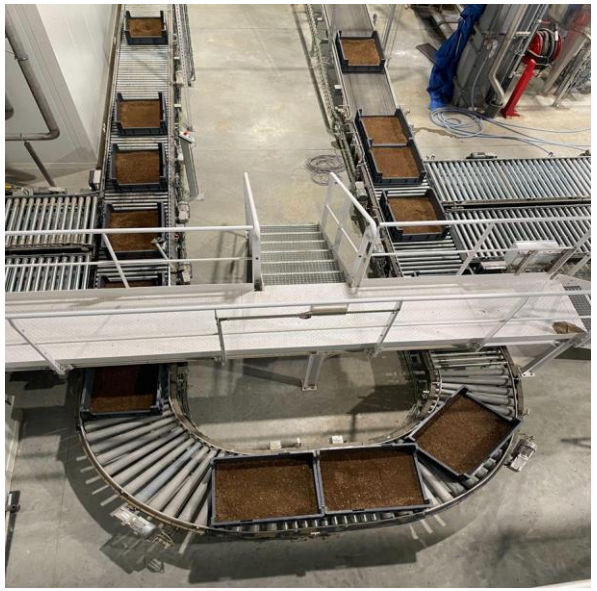
Ultra'In

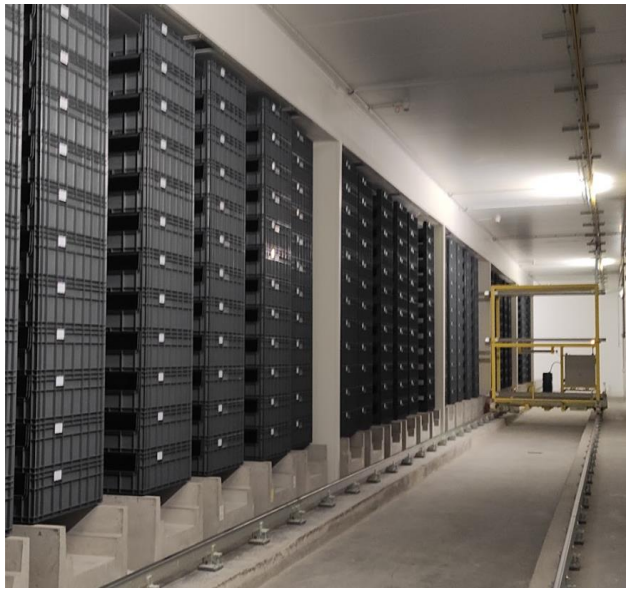
Liboost

A First Factory in the East of France

16.000m² factory







02

The BSF industry in pet food

Supporting the sustainable growth of pet food manufacturers

The pet food industry is facing a complex scenario

How can the BSF industry be part of the solution?

In an uncertain context of **raw material availability** and **supply chain risks**, how to face the forecasted **growth of the industry**, while ensuring ambitious objectives of **CO_2 emission reduction**?

Pet food Industry needs		BSF industry solutions & challenges
Nutritional performance	High **quality protein** sources to ensure industry growth	High digestibility and good palatability
Environmental performance	Sustainable sources of protein to support the ambition to **decarbonate** the industry	Low carbon footprint Circular economy
Economical performance	**high volumes** to mitigate sourcing risks	Availability and price thanks to scale & investments

Lessons learned from 3 mature sectors for the BSF industry

on the evolution of zootechnical and genetic indicators

It is relevant to consider **the future of the European BSF sector** in light of the evolution of 3 more mature sectors:

the pork sector
the broiler sector
The whiteleg shrimp sectors

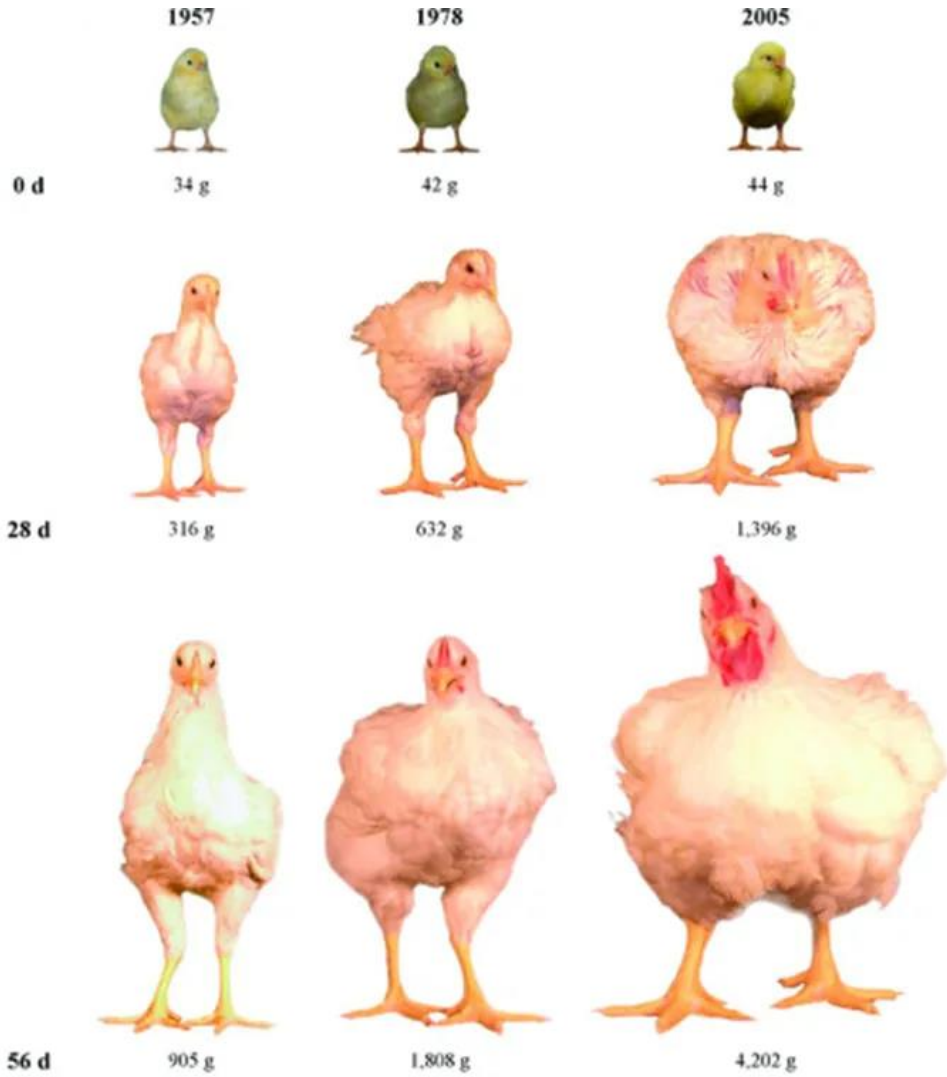
The presentation will focus on :

- the evolution of the **FCR** over time
- the **genetic progress** through selection patterns

A picture speaks a thousand words

Evolution of the weight of standard chicken between 1957, 1978 and 2005 *(University of Alberta, 2005)*

In 50 years
the poultry sector has seen
the weight of a standard chicken
multiplied by over 4,5



03

What can we learn from the evolution of the FCR?

Feed Conversion Ratio

What is the FCR and why is it critical?

Short definition

In animal production the **feed conversion ratio** (**FCR**) measures **the efficiency** with which the animals **convert animal feed** into the desired output.

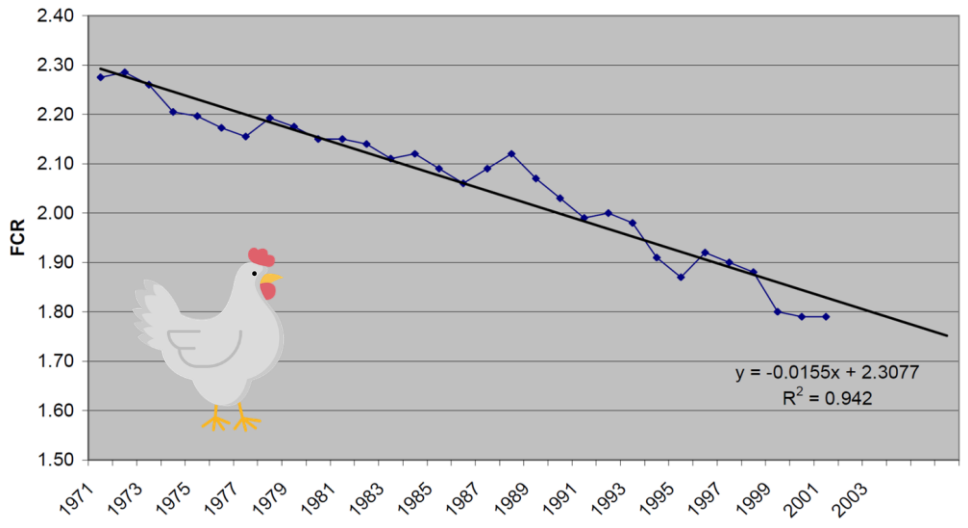
For dairy cows, for example, the output is milk, whereas in animals raised for meat such as beef, pigs, chickens, fish **and insects** the output is the **body mass** gained by the animal.

$$FCR = \frac{\text{Food Intake}}{\text{Animal weight gained}}$$

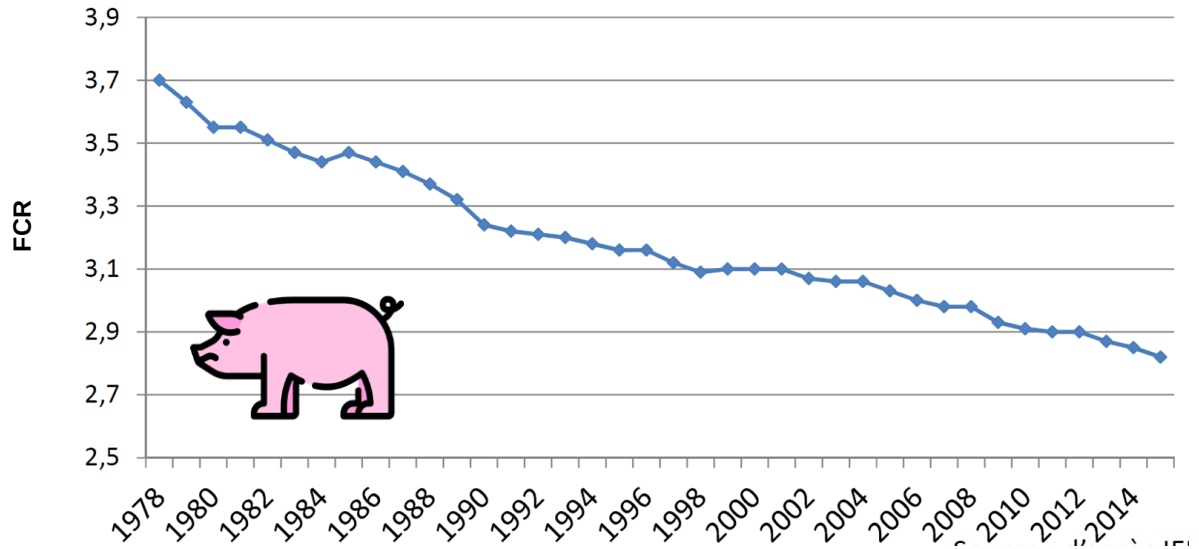
The lower the FCR the better

Sources: Aviagen ; Michel Sourdioux, SYSAAF

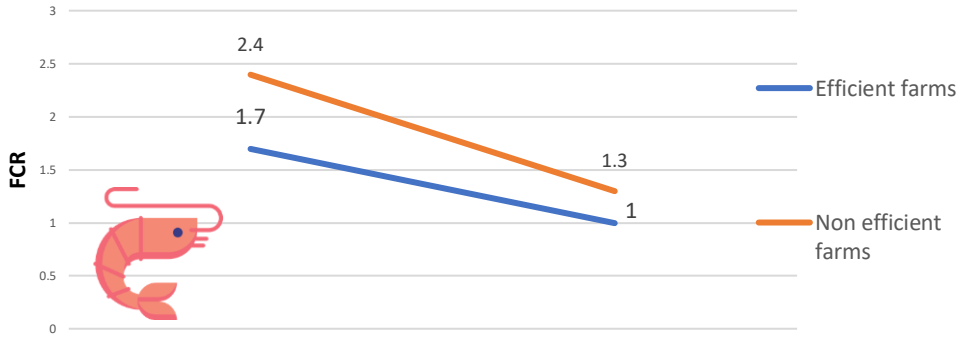
Improvement of FCR over time in mature sectors



FCR evolution (kg feed per kg liveweight) for the UK broiler industry (NFU Broiler Bulletins)



FCR evolution for the French pig industry (IFIP, 2016)



FCR evolution for the Ecuador shrimp industry

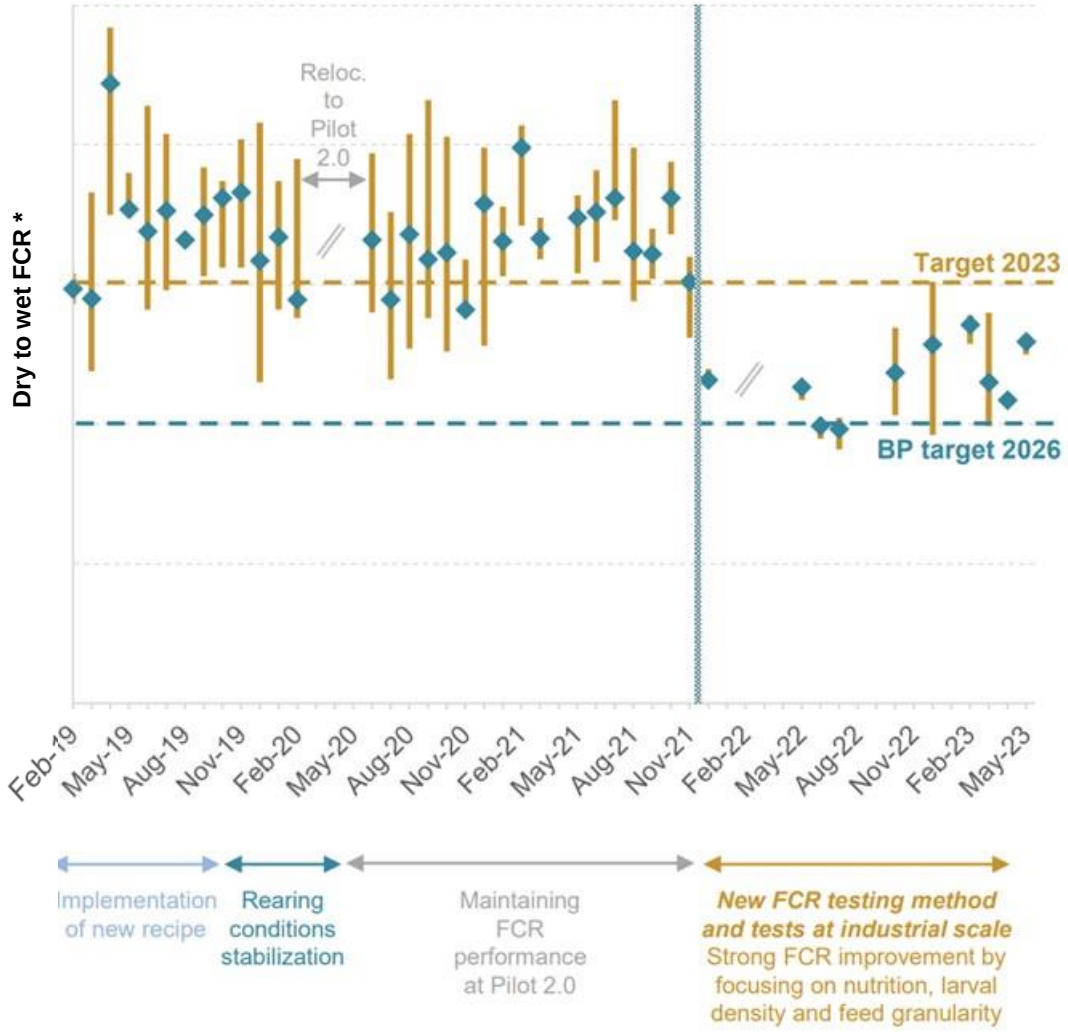
All mature sector see their FCR improve overtime thanks to :

- **Genetic progress**
- **Rearing conditions** (notably feeding methods)

Sources: Aviagen ; Michel Sourdioux, SYSAAF

Improving the FCR of the BSF larvae is a strong focus for Agronutris

Results show significant improvements with pilot plant consistently reaching 1,0 FCR



Agronutris improved FCR by 30% over the past 18 months thanks to 3 key parameters :

- **Nutrition** : adressing larval needs in terms of vitamins, minerals and amino acids
- **Climate control** to improve rearing conditions
- **Larval density**

Agronutris

Source : Agronutris internal data

* Feedstock dry matter divided by larvae biomass : : conversion of N kt of dry feedstock into 1kg of larvae

04

What can we learn from the genetic progress through selection patterns ?

The example of the pig sector and lessons learned

Zootechnical criteria selected for performance

Zootechnical criteria having seen performance improvement thanks to genetic selection in the pig sector :

Female lines

Productivity *(number of piglets born alive, number of piglets weaned, breeding rate)*,
Maternal qualities *(ability of sows to wean piglets, number of teats, milk capacity of sows)*,
Production traits *(growth)*

Male lines

Feed efficiency
Carcass composition *(fat thickness, muscle content)*
Meat quality *(water retention, intramuscular fat)*

- Create **"pure" lines** with a form of reasoned specialisation: resistant, efficient, prolific
- Take advantage of the **heterosis effect** to accelerate genetic development
- **Accelerate genetic research** by pooling results or exchanging "lines" between companies
- Accelerate industry structuration with **companies specialised in genetics**

Source : Résultats GTE Nord Bretagne - IFIP, 2020. Bailey RA, Souza E and Avendano S (2020) Characterising the Influence of Genetics on Breast Muscle Myopathies in Broiler Chickens. Front. Physiol.

Agonutris method of genetic selection

Selection of heavier larvae at 13 days of life (DOL) since june 2022

Nucleus
start

Nucleus
12th Generation
+41K indiv.
weight

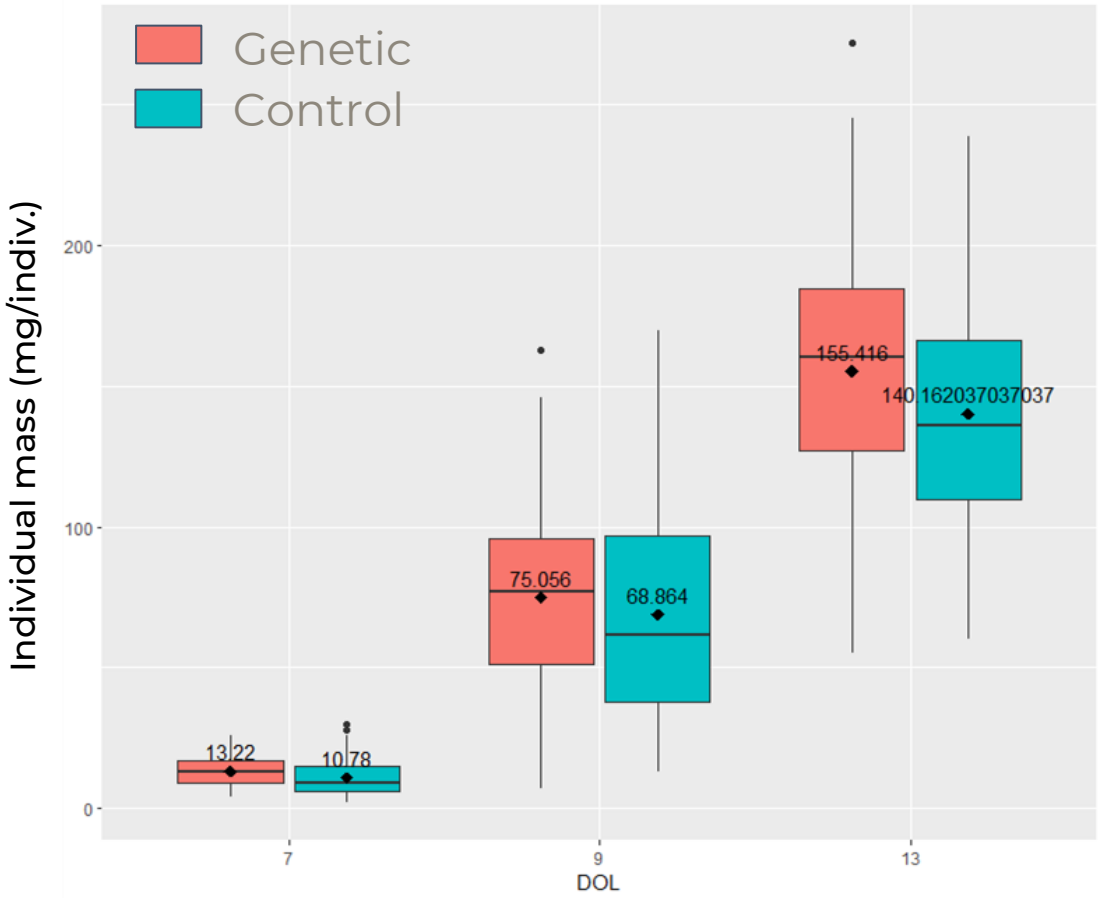
June 22 // June 23 Jan 24 June 25




Container	Small	Crate
Climate	Static	Dynamic
Location	Pilote	Factory

Results of the Agronutris genetic research progarm

Higher weight gain for the selected genetic line



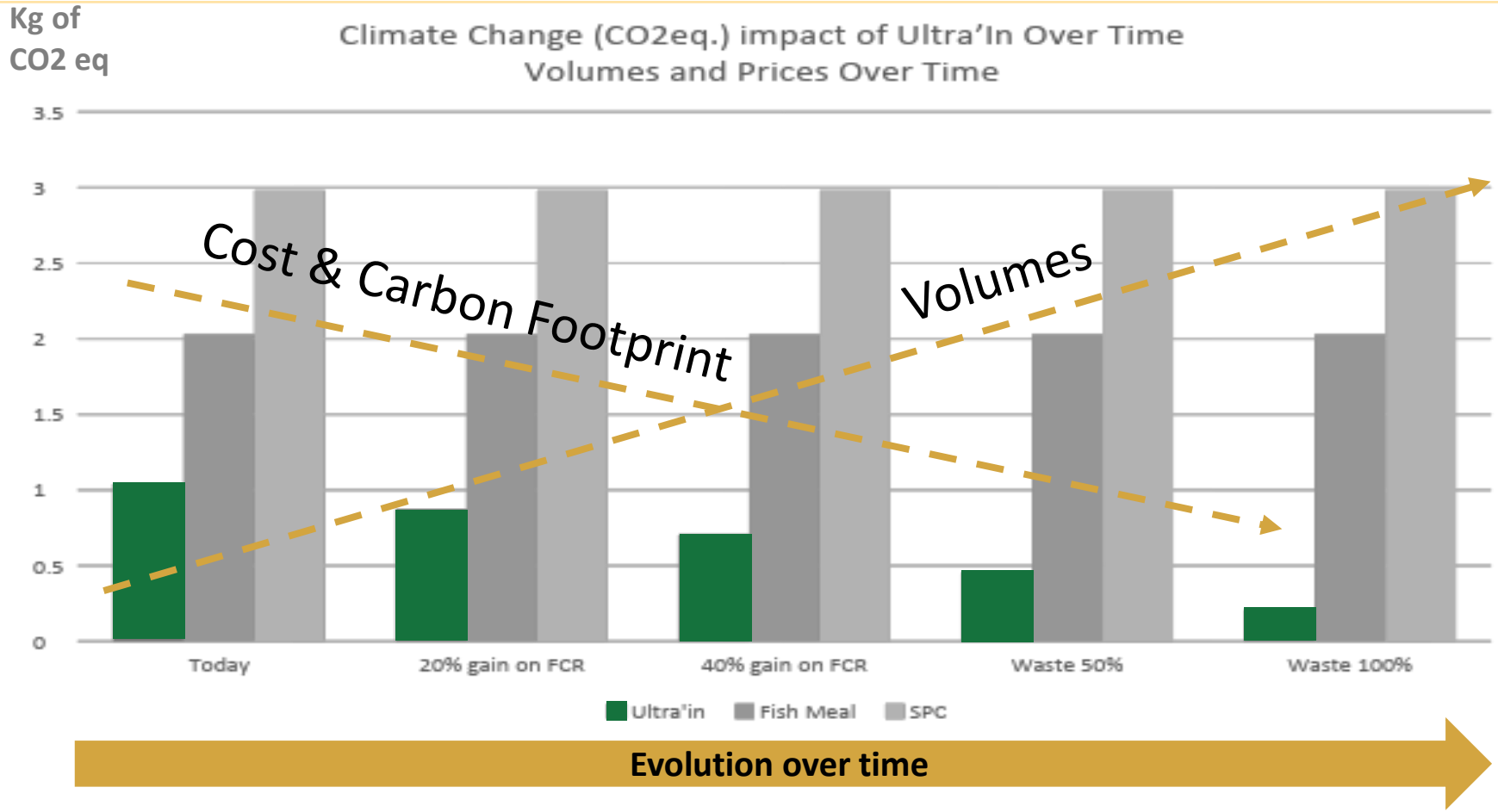
+11% weight gain for selected genetic line

05

Impact on the cost and carbon footprint of BSF meal

Scale, R&D and waste will significantly lower the cost & Carbon Footprint Impact of BSF meal

In the coming years the BSF industry we will increase its competitivity with the other protein sources



the LCA has been out together by iCare but not yet been critically reviewed.

Questions?

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