

Use case: Evaluate the impact of different commercial feeds on trout production performance

This use case illustrates how FEEDNETICS™ can be used to evaluate the impact of two high energy feeds on rainbow trout production performance, and to quantify savings on feed obtained by the best performing scenario. This use case was set up for a generic RAS farm and two commercial feeds used by the rainbow trout RAS industry were considered. The key results and outcomes are presented in the figure below and are only applicable to the input data specified. Changes in rearing temperature, feed properties, feeding rates and target harvest weight will alter results and main outcomes. In this case, the main outcomes identify Aquafeed 1 as leading to an overall better performance, including a significant decrease in the total N and P wastes, as well significant better economic conversion. This information is highly relevant for optimizing RAS production as it implies a balance between fish growth, feed efficiency, water quality and profitability. Evaluating feeding efficiency indicators is very important, not only for feed conversion economics, but also for planning and managing the biofilter.

Use case | Evaluate the impact of different RAS feeds on trout production performance



Rainbow trout

OBJECTIVE

Evaluate the performance of rainbow trout fed two high-energy feeds used by the RAS industry, and quantify savings on feed, considering a harvest weight of 1 kg.

INPUT DATA

Production conditions

Initial weight **50 g**
Initial nr. of fish **15 000**
Mortality **1% per month**
Feed waste **0%**
Water temperature **~13 °C** (11 °C to 16 °C)



Feeding regime

• Aquafeed 1 is denser in nutrients, with higher digestible protein and lipids levels, targeting a reduced FCR.

• Improvements (Aquafeed 1) come at a higher cost (+6%).

	Aquafeed 1			Aquafeed 2		
Feed cost (% variation)	+6%			ref		
Proximate composition	3mm	4.5mm	6mm	3mm	4.5mm	6mm
Digestible protein (%)	41.6	40.5	35.2	38.6	37.0	33.9
Digestible lipids (%)	26.9	28.7	29.7	23.5	25.4	27.1
Digestible energy (MJ/kg)	22.4	22.6	22.8	21.1	21.4	21.9
DP/DE (g/MJ)	18.5	17.9	15.4	18.3	17.3	15.5
Digestible phosphorus (%)	0.6	0.6	0.5	0.8	0.7	0.6
Ash (%)	5.2	5.4	4.3	7.0	6.0	6.0
Fiber (%)	2.0	2.0	2.0	2.1	2.1	2.1
Amino acid profile	Default rainbow trout feed					
Fatty acid profile	Default rainbow trout feed					
Feed ration	Same feeding table					

PREDICTION OUTPUTS

Growth prediction

- Aquafeed 1 allows fish to reach the target weight (1 kg) 36 days earlier.



Performance at 1 kg

	Aquafeed 1	Aquafeed 2
Days in production	261	297
Growth rate (% BW per day)	1.16	1.01
FCR	1.05	1.21
Economic conversion ratio (€ feed/kg biomass gain)	1.08	1.18
Cumulative feeding (ton)	13.7	15.6
Total N waste (kg N/ton biomass gain)	41	49
Total P waste (kg P/ton biomass gain)	3.4	5.8
Savings on feeding (€ per ton of fish produced)	100	

MAIN OUTCOMES

The FEEDNETICS model predicts that **Aquafeed 1 leads to a better performance: shorter (12%) production cycle, improved FCR by 0.16 units, and decreased total N and P waste of about -17% and -43%, respectively**, when compared with the other high-energy feed. Aquafeed 1 better performance translates in **savings on feed of about 100 € per ton of fish produced**, despite its higher unit cost.