

Helping your fish cope with everyday challenges

Health stimulating and benchmarking



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LET'S INNOVATE AQUACULTURE

Agenda



- Probiotics
- B-WYSE
- Benchmarking

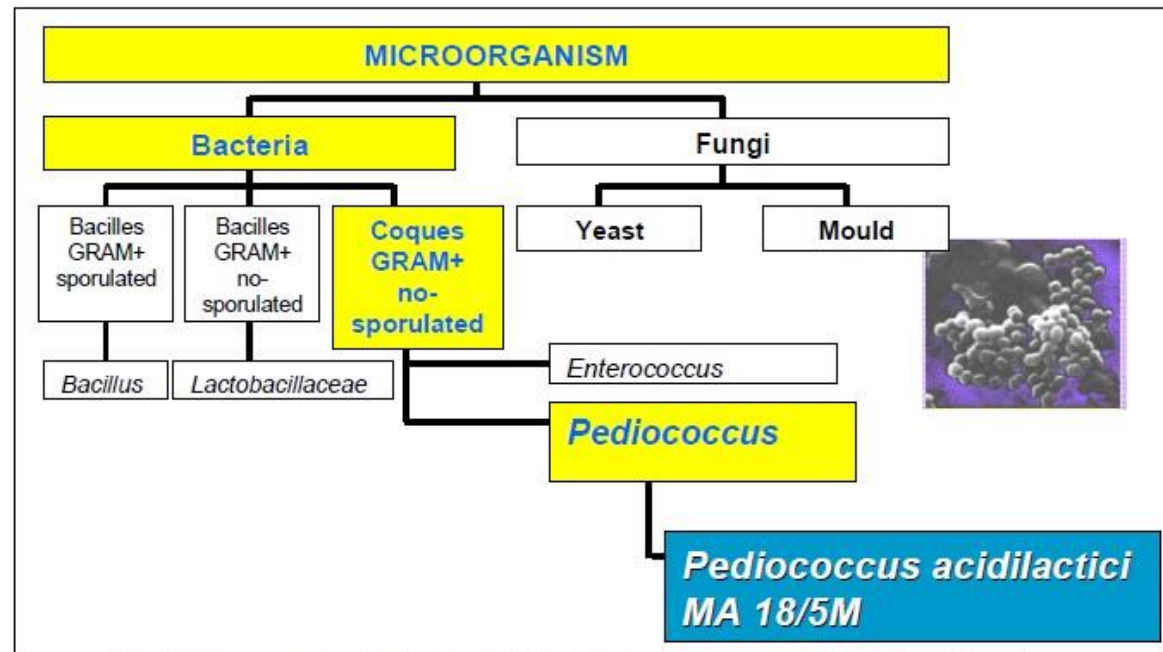


What are probiotics?

- The World Health Organisation (WHO) defines probiotics as live micro-organisms that, "**...when administered in adequate amounts, confer a health benefit on the host.**"
- Fermented milks are used for thousands years.
- The original modern hypothesis of the positive role played by certain bacteria was first introduced by Russian scientist and Nobel laureate Élie Metchnikoff, who in 1907 suggested that it would be possible to modify the gut flora and to replace harmful microbes with useful microbes.
- Today probiotics are widely used in food for humans and in animal farming



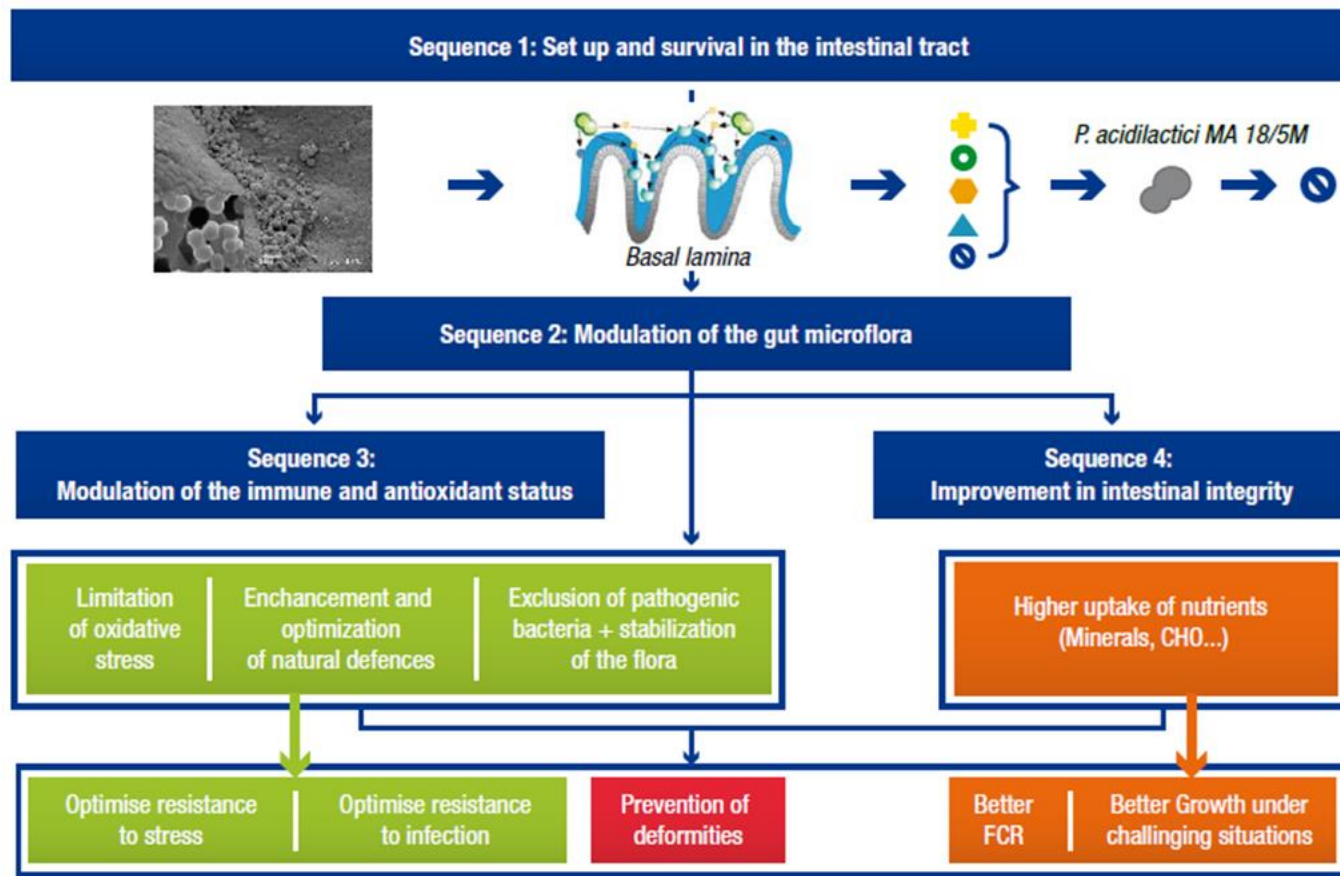
- Bactocell is LIVE bacteria (*Pediococcus acidilactici*) with probiotic properties. It is used in animal farming (pigs, chicken, fish, shrimp,...)
- Bactocell® is the only probiotic approved for aquaculture in E.U
- BioMar and Lallemend have worked together for over 10 years to obtain this approval



Pediococcus and other probiotics microorganisms classification

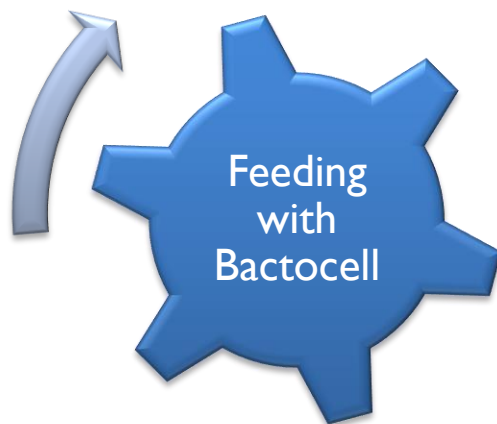
Mode of action

P. acidilactici MA18/5M: mode of action



Elaboration: Mathieu Castex, Lallemand SAS

Immune response through gut stimulation



Bactocell will have a direct effect on some Gram-negative bacteria sensitive to pH fluctuation such as:

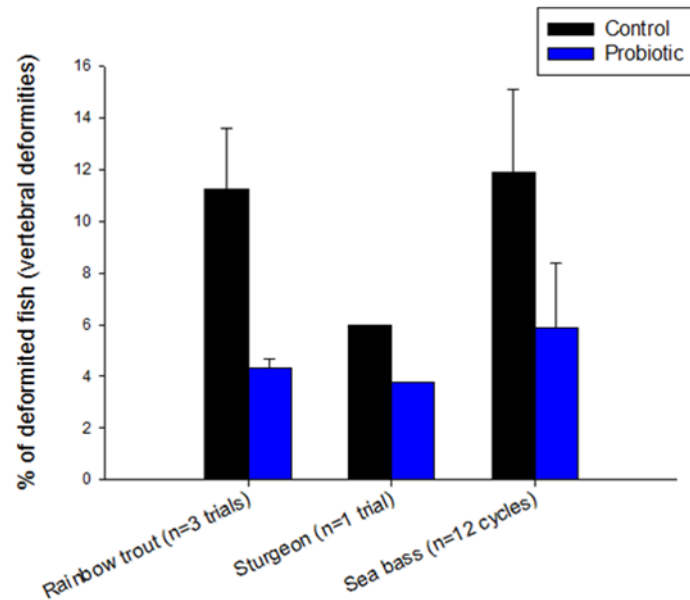
- *Vibrio* sp.
- *Pseudomonas* sp.
- *Aeromonas* sp.



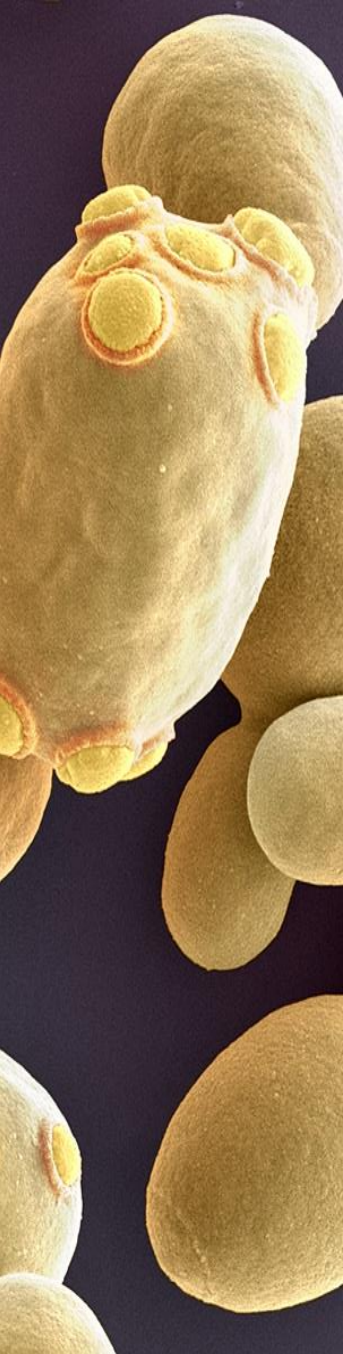
Reduced deformities with BACTOCELL[®]



- Its effects are very well documented, in multiple internal BioMar trials, on many domains such as:
 - gut health
 - mineral uptake
 - disease resistance (competition with pathogenic bacteria)
 - increased micro villi height... But it is for its effect on reduction of spinal deformities (patent EPI 656150) that the E.U approval was obtained



B-WYSE



B-WYSE™



- B-WYSE stands for **B**ioMar **W**hole **Y**east **S**ynergistic **E**xtracts
- Produced and patented by Lallemand 
- The documentation of the additive has been made in collaboration between BioMar and Lallemand
- Differences in yeast derivatives are large and the production processes are important for the extract properties

B-WYSE is a yeast product which is special as it is composed of three different strains of yeast:

- Different strains have different functions
- Each strain of yeast used in B-WYSE have stronger binding properties than other strains
- The combination of different strains have proven to show synergistic effect, i.e. better than expected when assessing the effects strain by strain
- More routes of action for immune modulation are activated/enhanced with B-WYSE

Yeast fractions and their properties

β -glucans

- Yeast-Cell-Wall fraction targeting high β -1,3/1,6-glucans content
- Immune-stimulation

MOS

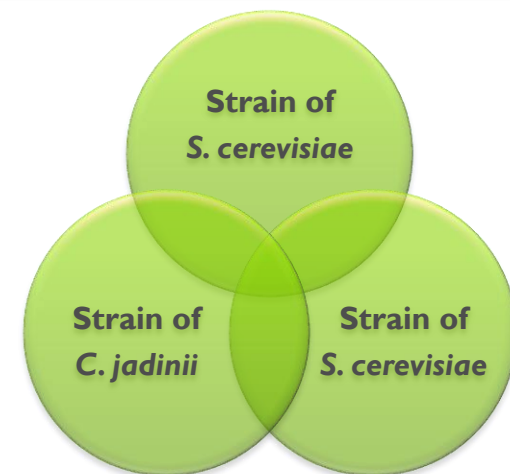
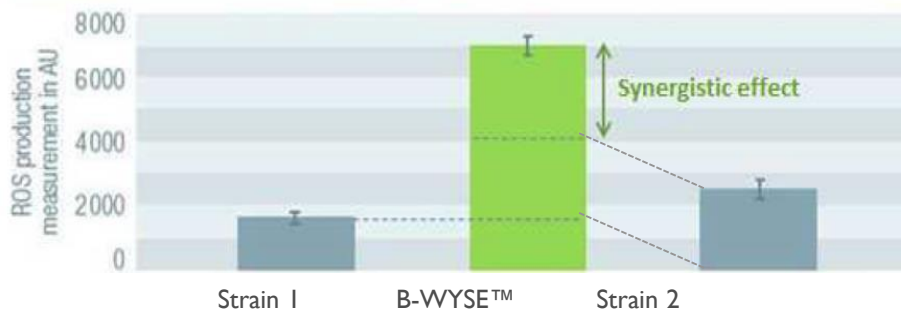
- Yeast-Cell-Wall fraction targeting high Mannans content
- Undesirable bacteria blocker; gut integrity and immunity

B-WYSE™

- Cell-Wall and other yeast fractions targeting synergistic immune modulation
- Broad and balanced immune modulation. It acts in the same way as both β -glucans, and MOS, but also in a new way unique to B-WYSE. The effects of several strains has proven stronger (synergistic)
- Peripheral mucosal health (skin and gill)
- Undesirable bacteria blocker, gut integrity and immunity

Single-yeast strain of *S. cerevisiae*

Production of reactive oxygen species (ROS) by immune system cells
Incubation with different strains of yeast



How and when to use it?

B-WYSE is possible to use over a prolonged time-period, which makes it well-suited to support immunity and mucosal health over the rearing cycle

B-WYSE will support:

- the negative cycle of stress-induced immune-suppression
- pathogen susceptibility
- treatment side-effects
- accumulative damages and re-infection

Functions of B-WYSE™ and Bactocell®

Broad and balanced immune-modulation (multi-pathways)

- Stimulates the immune system – also during continuous use
- Stimulates the inflammatory response
- Reaching the mucosal levels

Outer mucosal health (skin and gill)

- Increases skin mucus production and has antimicrobial properties
- Gill benefits

Enteric disease control

- Blocks undesirable pathogens as B-WYSE has adhesive properties which reduces the colonizing ability of the pathogen.

Gut integrity

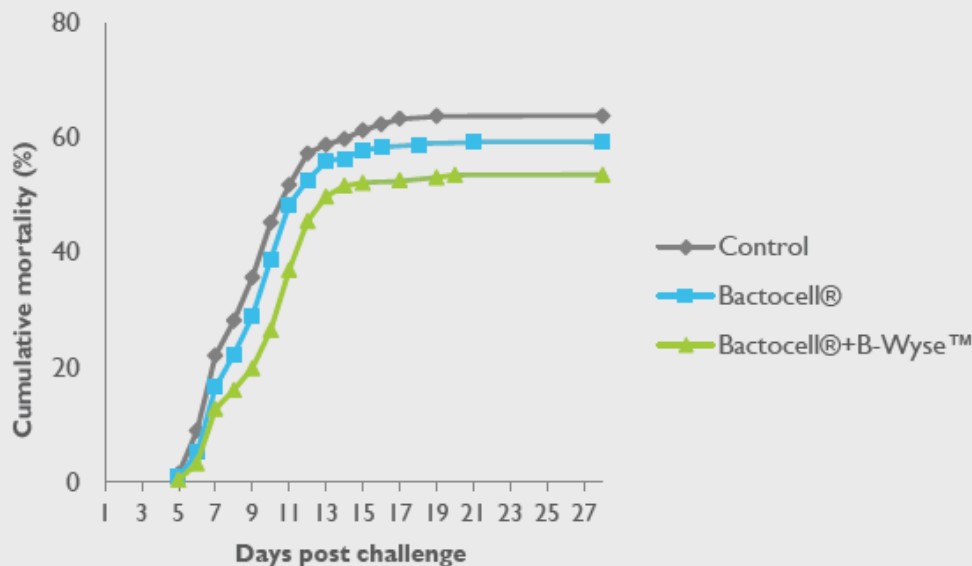
- Lower mucosal damage from lower bacterial translocation
- Increased gut mucus secretion and epithelial health¹

¹Epithelial tissues line the outer surfaces of organs and blood vessels throughout the body, as well as the inner surfaces of cavities in many internal organs. Includes also the outer layer of the skin.

Trial Results with B-WYSE™ and Bactocell®

BETTER SURVIVAL RATES WITH BACTOCELL® AND B-WYSE™

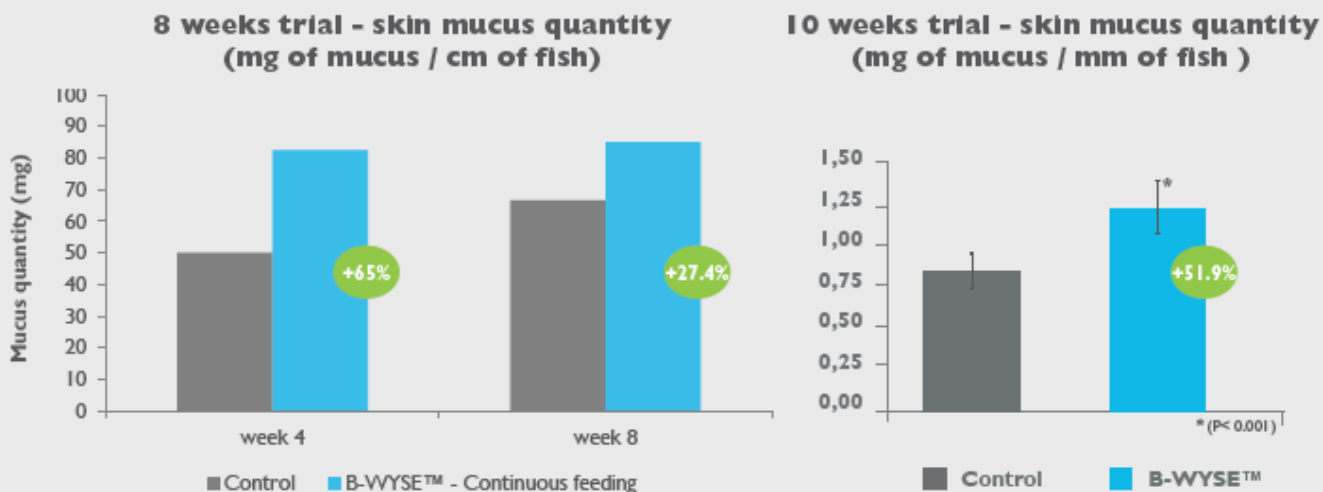
A challenge trial with *Yersinia ruckerii* (bath) showed a significant increased survival when fed Bactocell® and B-WYSE™



Trial Results with B-WYSE™

INCREASED MUCUS PRODUCTION WITH B-WYSE™**

Mucus production is one of the first and very important immune barriers of the fish to fight external, environmental and physical threats.



The background of the slide is a close-up, black and white photograph of fish scales, showing their overlapping, diamond-like pattern. A horizontal teal band is superimposed across the middle of the image.

Benchmarking

Definition of benchmarking

“the continuous process of measuring products, services and practices against external (competitors) or internal products”



Feed trials

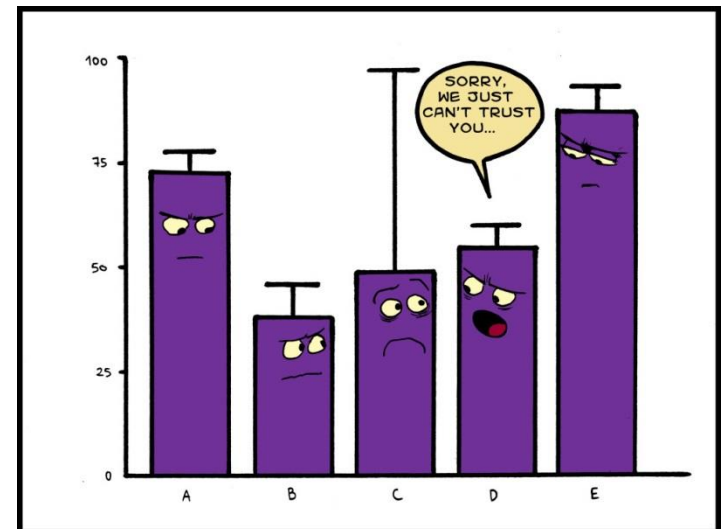
It is not difficult to do feed trials and the measures to be taken are fairly simple, **BUT** some thinking should be done before starting a trial!

Make sure that:

- the fish are a homogeneous group which means fish of the same strain, year and grade
- the trial facilities are identical with regard to size and shape
- the water quality (oxygen) is identical
- the setup is optimal so all ponds/tanks gets the same water flow

It is also important to have at least three units on each feed code in order to obtain a reliable result!

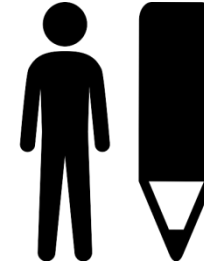
- this will give information about the variation in the results and thereby the reliability of the trial



Feed trials – start up

Accuracy:

- Weighing the fish in the beginning and end of the trial
- Measuring daily feed
- Collecting dead fish (mortality)
- **BUT** also important to be accurate when something deviates from the original plan!



Attention:

- Important to note minor and less obvious differences between trial units such as appetite, agitation, faeces etc.

Registration:

- Record all observations and unexpected turn of events such as removal of fish from trial units or feeding with medicated feed instead of trial feed
- Do not necessarily stop the trial if something unexpected happens – record it and discuss with BioFarm

Feed trials – trial feeds

- Collection of feed from BioMar
- Analysis of the feed
 - Feed has declared values of fat, protein etc (on label), but we analyse the feed in order to calculate digestible energy
 - The analysis also tells us if something is wrong with feed and we can abort the trial
- Feed is re-sacked into white, neutral bags and the label is given test-name



Feed trials – contact & evaluation

- It is important to be in close contact with the farm or research station
- At the end of a feed trial the farmer or trial station sends data back to BioMar for evaluation (either as hand written notes or in a spreadsheet)
- All trial data is uploaded to a file which calculates different parameters such as FCR, growth, feed intensity, value of additional growth etc.....



Kar Kode	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10
Biomass, init. (kg)	EA 714	EA 717	EA 718	EA 790	EE 920	EE 920 ADV	EE 922	EE 923	EE 926	ORBIT 92
Biomass, end (kg)	5,13	5,02	5,11	5,09	5	5,05	5,14	5,06	5,12	5,17
Mortality (kg)	11,76	11,52	11,44	11,2	12,93	11,68	11,38	11,23	10,93	10,96
Gain (kg)	0	0	0	0	0	0	0,2793	0	0,3227	0
Individuals, start (pcs.)	6,63	6,5	6,33	6,11	7,93	6,63	6,5193	6,17	6,1327	5,8
Individuals, end (pcs.)	19	19	19	21	21	20	21	21	21	20
Individual weight, start (g)	19	19	19	21	21	20	22	21	22	20
Individual weight, end (g)	270,000	264,211	268,947	242,381	238,095	252,500	233,636	240,952	232,727	255,500
Feeding days (days)	618,947	606,316	572,000	533,333	615,714	584,000	541,905	534,762	520,476	549,000
Feed adm. (g)	53	53	53	53	53	53	53	53	53	53
Pellet waste (g), wet weight	7960	7410	7085	6085	7526	6335	6480	6250	6065	5775
Pellet waste (g), dry weight	390,9183	787,4717	710,85	798,9327	570,4908	645,8605	607,2188	622,6339	705,4236	647,317
Feed ingested, whole period (g)	7569,1	6622,5	6374,2	5286,1	6955,5	5689,1	5872,8	5627,4	5359,6	5127,7
Feed conversion ratio (FCR)	1,142	1,019	1,007	0,865	0,877	0,858	0,901	0,912	0,874	0,874
Specific growth rate (% day)	1,57%	1,57%	1,52%	1,49%	1,79%	1,58%	1,55%	1,50%	1,49%	1,44%
FI (%/day)	1,79%	1,60%	1,53%	1,29%	1,57%	1,36%	1,39%	1,37%	1,30%	1,26%

Value of growth



FEED A

(HIGH DGR)

Final weight A
159204 Kg

Starting weight A
16500 Kg

Growth A
142704 Kg

Feed conversion rate A
0.92

Feedprice A
1.80 Euro

Feed exence A
236318 Euro

FEED B

(LOW DGR)

Final weight B
150504 Kg

Starting weight B
16500 Kg

Growth B
134004 Kg

Feed conversion rate B
1.06

Feedprice B
1.55 Euro

Feed exence B
220169 Euro

FEED A

Feed name A

EA790 EA790

Feed conversion A

0.92

Feed price A

1.80 Euro

Daily Growth Rate A

1.25

FEED B

Feed name B

EA717 EA717

Feed conversion B

1.06

Feed price B

1.55 Euro

Daily Growth Rate B

1.22

1.66 Euro/kg growth

1.64 Euro/kg growth

Additional growth
8700 Kg

Fish price (round)
3.56 Euro

Value of additional growth
30,972.00 Euro

Additional feed expenses
16,149 Euro

Net financial benefit
14,822.75 Euro

Growth A
142704 Kg

Feed conversion A
0.92

Additional value per kg Feed
0.11 Euro/kg

Date: _____
 Fish farm: BioMar
 Sales rep.: _____
 No. of days: 182
 Fish price(round): 3.56 Euro

Thank you for your attention!

If you wish to know about our products which contain BWYSE and Bactocell please come and talk to us.



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