



**NATIONAL  
AQUARIUM**



## **CHANGING FEEDING STRATEGIES IN A LARGE MULTI-SPECIES EXHIBIT**

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## ATLANTIC CORAL REEF - LARGE MULTI-SPECIES EXHIBIT

- A 335,000 Gallon Tropical Western Atlantic Exhibit
- Houses 80 species and 735 individuals
- Current version of the exhibit opened in April 1995
- Managed with teams of volunteer divers





### WHY CONSIDER CHANGING?

- Fish health
- Feeding challenges
- Water quality
- Cost



# CALCULATING FOOD WEIGHTS

Common Name	Scientific Name	Qty.	Est. Av. Weight (kg)	Est. Total Biomass (kg)	Energy Level	% Food Weight	Food Weight (kg)
Blue Tang	<i>Acanthurus coeruleus</i>	132	1	132	High	3%	3.96
Bluehead Wrasse	<i>Thalassoma bifasciatum</i>	27	0.015	0.405	High	3%	0.01215
Bluestriped Grunt	<i>Haemulon sciurus</i>	12	1	12	Medium	2%	0.24
Buffalo Trunkfish	<i>Lactophrys trigonus</i>	1	0.25	0.25	High	3%	0.0075
Clown Wrasse	<i>Halichoeres maculipinna</i>	21	0.015	0.315	High	3%	0.00945
Cocoa Damselfish	<i>Stegastes variabilis</i>	8	0.015	0.12	Low	1%	0.0012

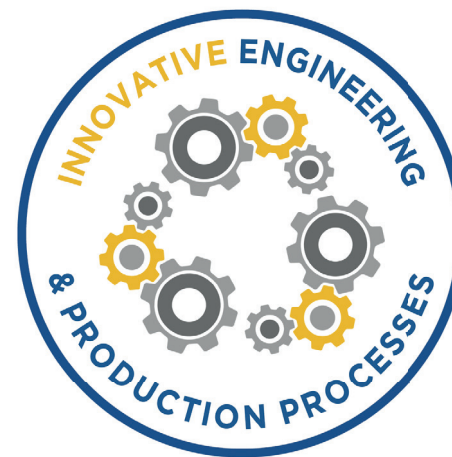


### WHY VITALIS?

- Quality ingredients
- Sustainability
- Sample Test

### WORLD FEEDS™

- Full inspection of raw materials on arrival
- Hygiene & contamination prevention
- Full inspection of manufactured products
- Veterinary inspected & certified by UK government





### PROCESS OF CHANGING

- Feed test of sizes
- Gradual change



### THEN & NOW

- Almost completely eliminated krill use
- Reduced shrimp, squid, smelt and mackerel use
- Eliminated whole clam meat
- Added “Medium” Marine Pellets
- Added “Medium” Algae Pellets
- Added “Small” Marine Pellets
- Added “Small” Algae Pellets
- Added crushed Marine Flake
- Added Grazing Diet

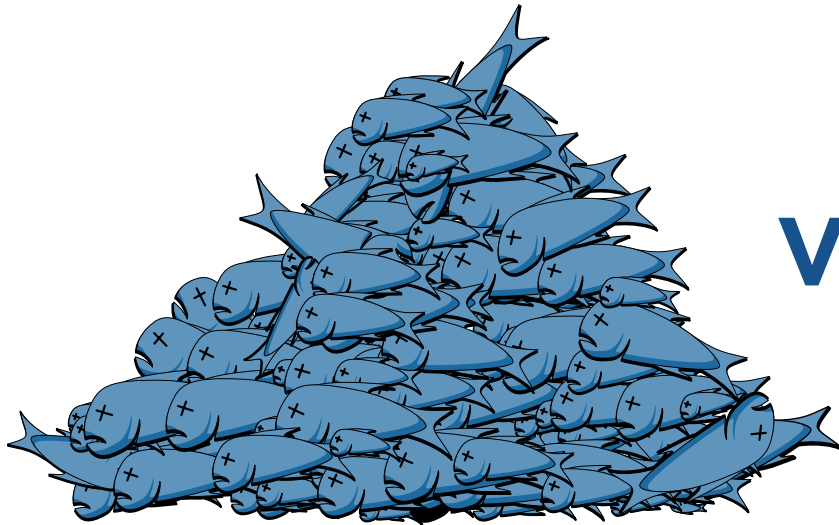
**OVERALL REDUCTION of  
10 lbs of food per day!**

**3,650 lbs in a year!**



### BENEFITS OF CHANGE

- Improved Fish Health
- Reduced Cost
- Reduced Preparation and Feeding Time
- Improved Water Quality



VS





### BENEFITS OF CHANGE: IMPROVED FISH HEALTH

- Reduced obesity
- Improved coloration
- Weight gain in some hard to target fish
- Better able to surface feed when divers are not available (holidays, snowy days)
- Increased ability to get food to smaller fish and grazers



### BENEFITS OF CHANGE: REDUCED COST

- Feeding costs reduced by just over 50%
- For the entire department the savings was \$35,000
- One 1kg of Vitalis is estimated to be equivalent to 10kg of wet fish
- No freezer costs
- Long shelf life
- Cost of wet food preparation time



### BENEFITS OF CHANGE: REDUCED PREPARATION & FEEDING TIME

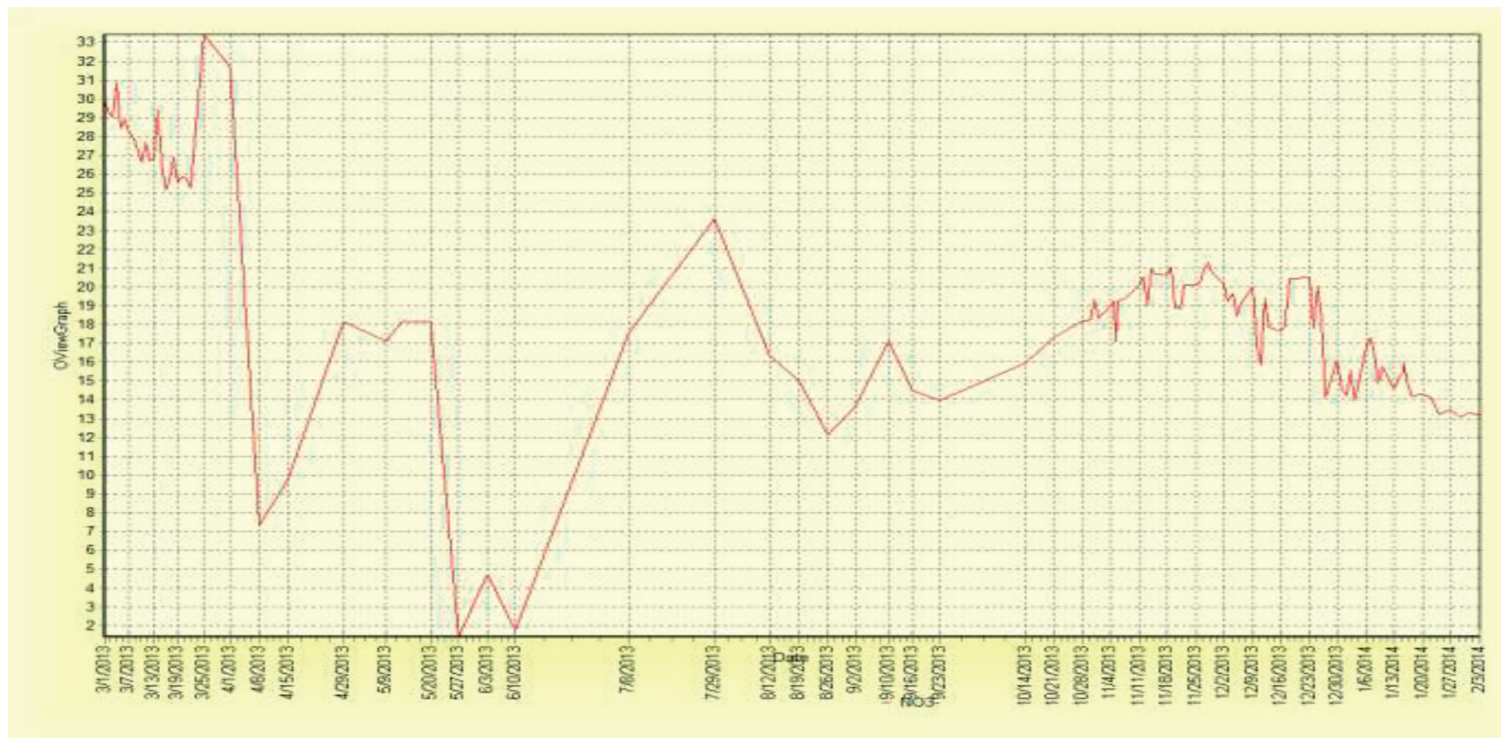
- Differently sized pellets mean no cutting or chopping - simply weigh out!
- Prep time for exhibit feedings cut in half
- 1/10 Ratio means less food to feed out





# BENEFITS OF CHANGE: IMPROVED WATER QUALITY

- Increased water clarity after feeding
- Reduced nitrate levels in system
- Less Food = Less Waste



## CONCLUSIONS

- ✓ Sustainable
- ✓ Less expensive
- ✓ Produces healthy fish
- ✓ Readily eaten by fish
- ✓ Improved water quality
- ✓ Reduced preparation time
- ✓ Reduced feeding time

