



## 8. Maring Fag Dag



*- Using marine offcuts to penetrate the high value nutrition market*

**29. November 2012**

# Hofseth BioCare – overview

## - From off cuts to premium ingredients

- Roots go back to 2000
- Significant amounts invested in R&D and production process
- **Proprietary technology** based upon a new method for fully controlled bi-product refinement up to high-end products
- New state of the art processing plant in Midsund
  - Processing capacity of 12,500 MT
  - ~40% output final products
- Long term agreements for raw material supply
- Key objective to provide **high value added biomarine ingredients** to serve a growing demand of high grade protein, calcium and fish oil to the human market
- Second plant to be ready Q4 2013
  - Processing capacity of 18,000 MT

### Off cuts



### Marine Lipids (oil)



### Soluble Protein Hydrolysate (SPH)



### Partially Hydrolysed Protein (PHP)



### Marine calcium



# State of the art production facilities

- With key access to raw material

## State of the art production facilities

- State of the art hardware and technology for production of human grade ingredients
- GMP+ HACCP codex alimentarius practices, Operating under GMP dietary Supplements practices
- Spray Dry Facility (ex Tine) at Berkåk
- Locations selected with the purpose of close access to fresh raw material
  - Raw material supply agreements secured for each facility



## The first plant - Midsund

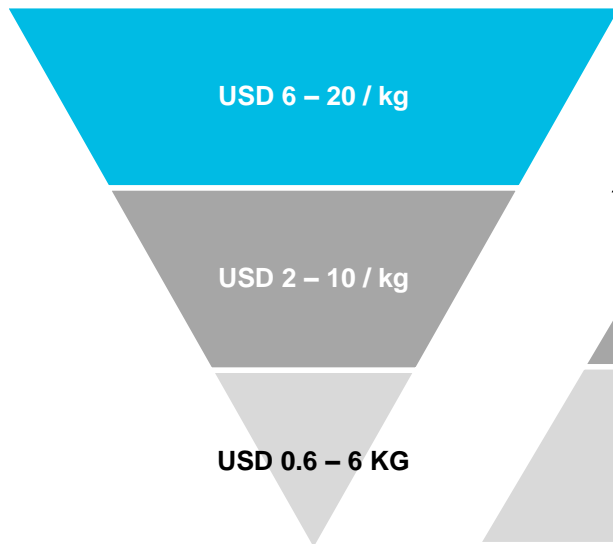
- Annual processing capacity of 12,500 tons raw material
  - 20 batches/day (of 2,500kg/batch) of raw material
  - Long term agreements for raw material supply with Hofseth International AS
- Total investment of close to NOK 100 million
- Official opening 31 August 2011
  - Currently operating at 4 shifts



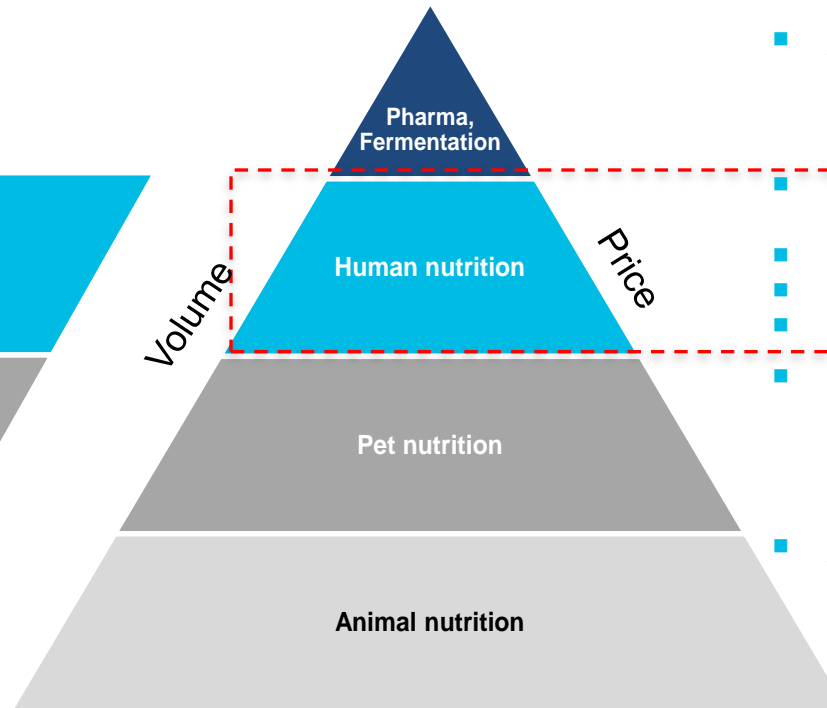
# Our market approach

## - Targeting the high value human nutrition market

### Indicative prices



### Market approach



- Attractive opportunities within the pharmaceutical segment in the longer term
- **Human nutrition market is the key target for HBC's products**
  - Dietary supplements
  - Sport Nutrition
  - Healthy and Functional Food
- Pet nutrition market is more differentiated than animal nutrition and hence offer higher prices
- Animal nutrition market could consume the total volume today, but is not considered a key market



# Marine bi-products

- A low valued resource with a high unexploited potential in the nutrition industry

## Marine bi-products

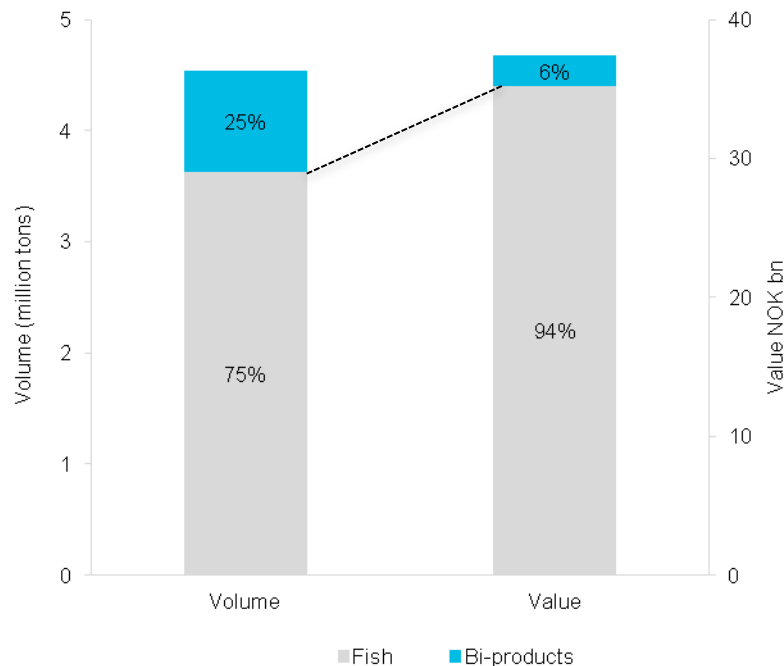
- Norwegian bi-products counts for 800,000 tons annually which is approximately 25% of all fishery and fish farming but only 6% of value
  - 75% of these are exploited, majority to animal nutrition
  - Currently creating values of NOK 1.5 – 2.2 bn. Considerable more potential within human nutrition
- High expectations for the future of marine bi-products industry:

*“Marine bioprospecting has the same potential as fish farming....”*

*“In retrospective the oil and gas industry will be in brackets compared to this industry...”*

- Norwegian Minister of Fisheries and Coastal Affairs

## Large volume, but small value



Source: Rubin.no

# HBC has developed a new advanced production process

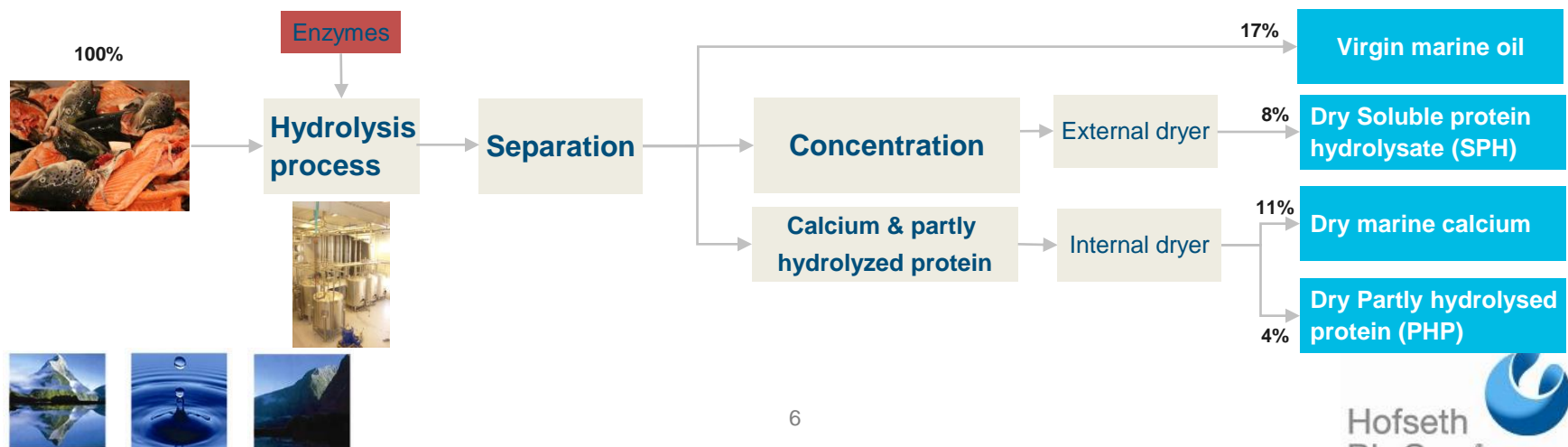
- Developed through years of testing and documentation

- Proprietary hydrolysis process that uses enzymes that gradually digest the protein in the raw material, breaking down the long chain proteins into shorter peptides chains, peptones, and if wanted, into the constituent amino acids
- Process avoids oxidation
- Maintains quality in raw material and extracts 4 product fractions
- Raw material and quality;
  - Fresh high quality (food grade) raw material supplied from trusted sources
  - Quality control



**Careful management of the hydrolyzing time, supply of enzymes, product fractions, temperature and moisture**

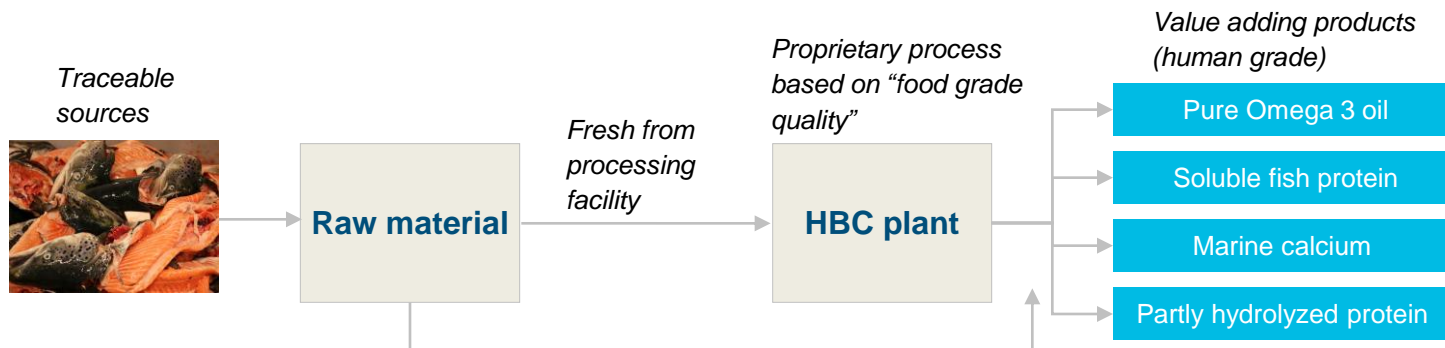
## HBC's proprietary enzymatic hydrolysis process



# Differentiating from conventional fish oil/fish meal production

- Natural freshness captured in the process

## HBC's proprietary enzymatic hydrolysis process



**<24hrs**



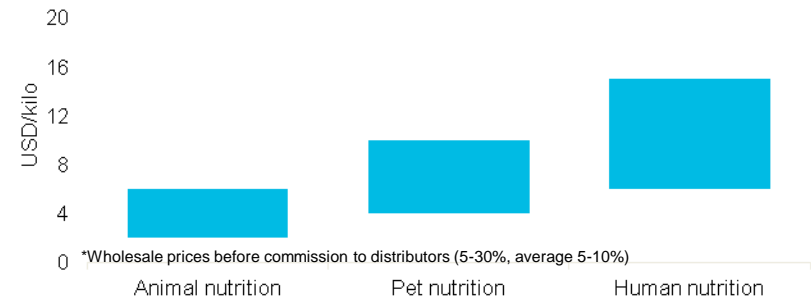
# Marine protein

## - Ideal for the high value hydrolysate market

### Product description

- HBC produces two different protein fractions
  - Soluable Protein Hydrolysate (SPH)
  - Partially Hydrolyzed Protein (PHP)
- The SPH is ideal for the high value hydrolysate market
- Amino acid profile complementing whey protein
- Studies showed that SPH can play an important role in reducing the development of obesity
- Pending patent (PCT) application on effect of SPH on iron uptake
- Value adding attributes;
  - Highly digestible
  - Low on fat
  - Highly concentrated
  - Good palatability (taste)

### Indicatives prices\*





# The protein ingredients market

## - Focus on the high-valued hydrolysate market

### Market characteristics

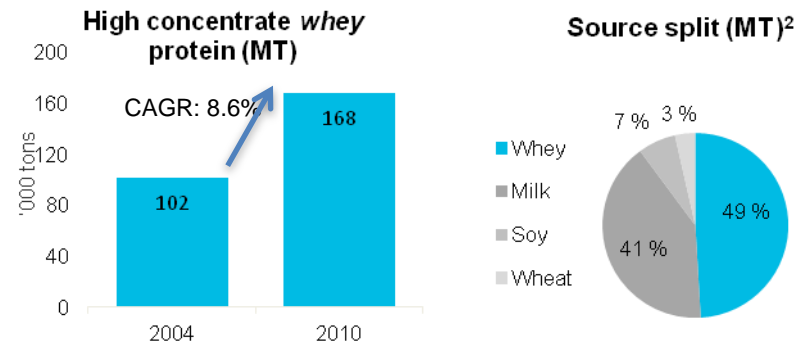
- Global human protein ingredient market of USD 57 bn and 20 million tons
  - Consists of a functional market (binder) and a nutritional market
- The nutritional market accounted for ~385,000 tons (incl hydrolysates) in year 2010 and is valued at USD 2.3 billion<sup>1</sup>
  - High concentrates ~80-90%
  - Main applications sports nutrition, functional food, infant nutrition, clinical nutrition
  - Growing market
- Hydrolysate is a premium product selling at higher prices due to its bioavailability, predigested and hypoallergenic applications
  - Total market 30,000 – 45,000 tons in year 2010, whereof ~15,000 tons are the accessible market and 14,400-30,000 tons are the captive market
  - Prices around USD 10 - 50 /kg
  - Limited use due to issues related to bitterness
  - Growing as more and more western countries regard hydrolysates as standard formulas
- Largest suppliers within hydrolysates are DMV Nutritionals (leading), Arla Food Ingredients, Glanbia, Davisco (key player US) Nestlé Nutrition(captive), Mead Johnson (captive)



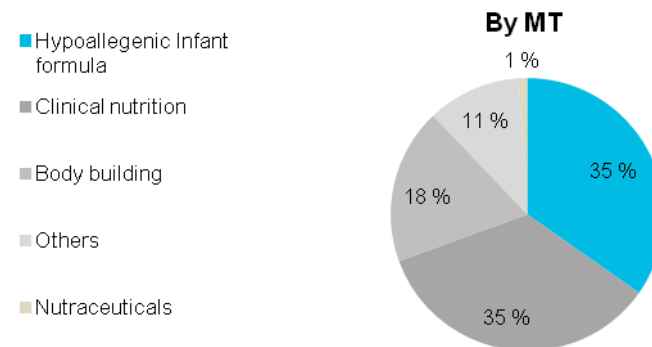
Source: UBIC World Protein Ingredient market, UBIC World Hydrolysate Market

- Based on average price for high protein concentrates 6 USD/kg
- Excluding hydrolysates

### High concentrate proteins 2010



### Segment split protein hydrolysates 2010



# Focus on sustainability and traceability gives HBC an attractive market proposition

## Sustainability

- The HBC process ensures optimal use of natural resources
- Fresh salmon offcuts that would otherwise have been waste or animal feed are used for making superior quality oil for human consumption



## Unique traceability

- HBC's complete vertical integration gives unparalleled safety
- Every single batch of oil that leaves the plant can be traced right back to its source
  - The fish farm
  - The batch of fry
  - The batch of roe
- Facilitates extremely detailed procedure control to prevent failures



# The pharma opportunity

- Several studies conducted on HBC's products have shown product attributes that have potential in the pharmaceutical market
  - Marine oil: significant reduction in oxidised LDL in studies performed on human
  - Protein: increased Iron uptake (animal)
    - Clear potential also for humans
- HBC has two PCT patent applications pending
  - In-turned licensed the nutraceutical and pharmaceutical markets to HBC
- Creates significant additional potential in the longer run
  - In cooperation with partner

