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Use of Omega 3 in Food Products

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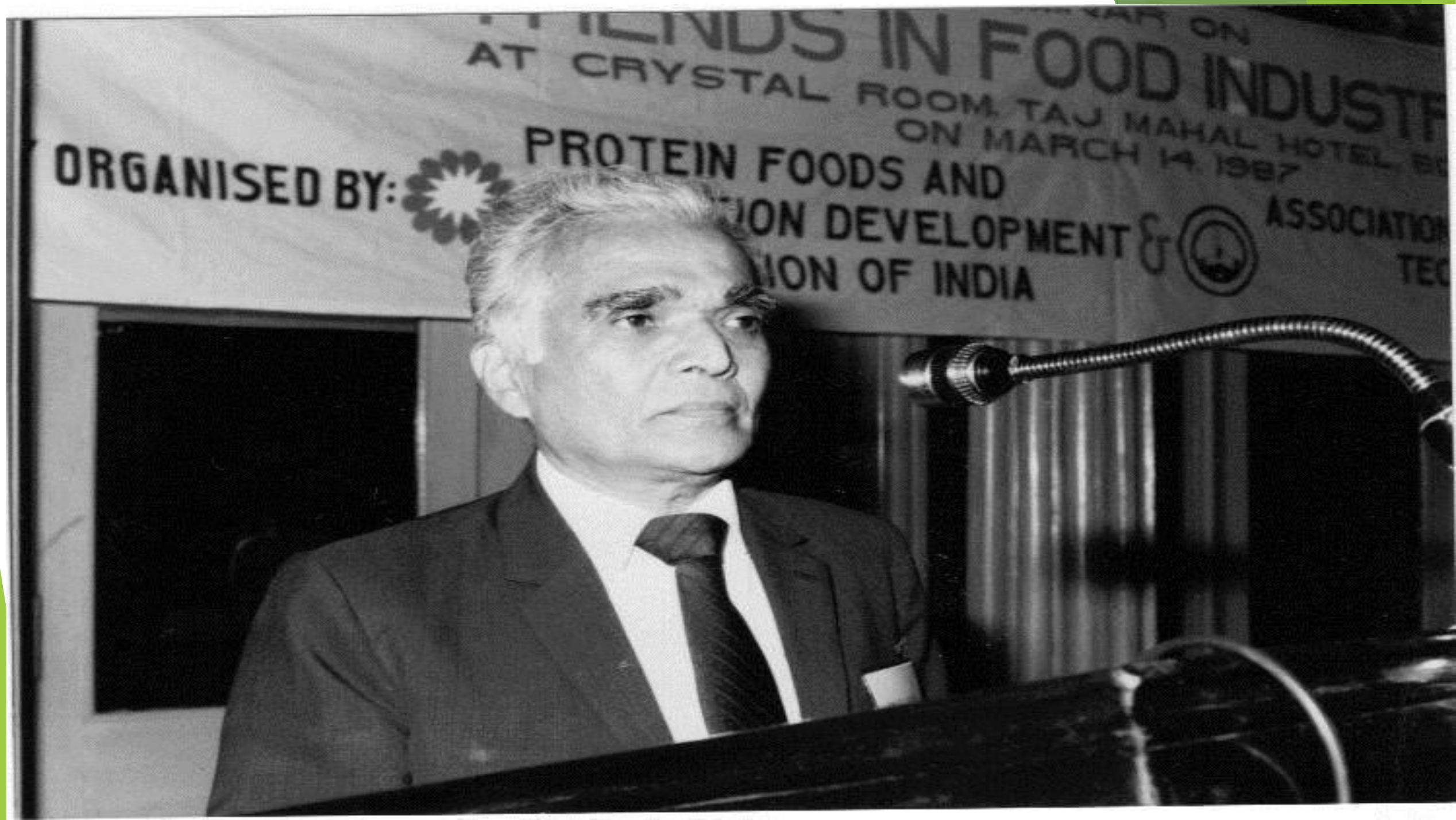
VR Food Tech Private Limited


AT CRYSTAL ROOM, TAJ MAHAL HOTEL
ON MARCH 14 1987
ORGANISED BY:
PROTEIN FOODS AND
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Why Fortification ?

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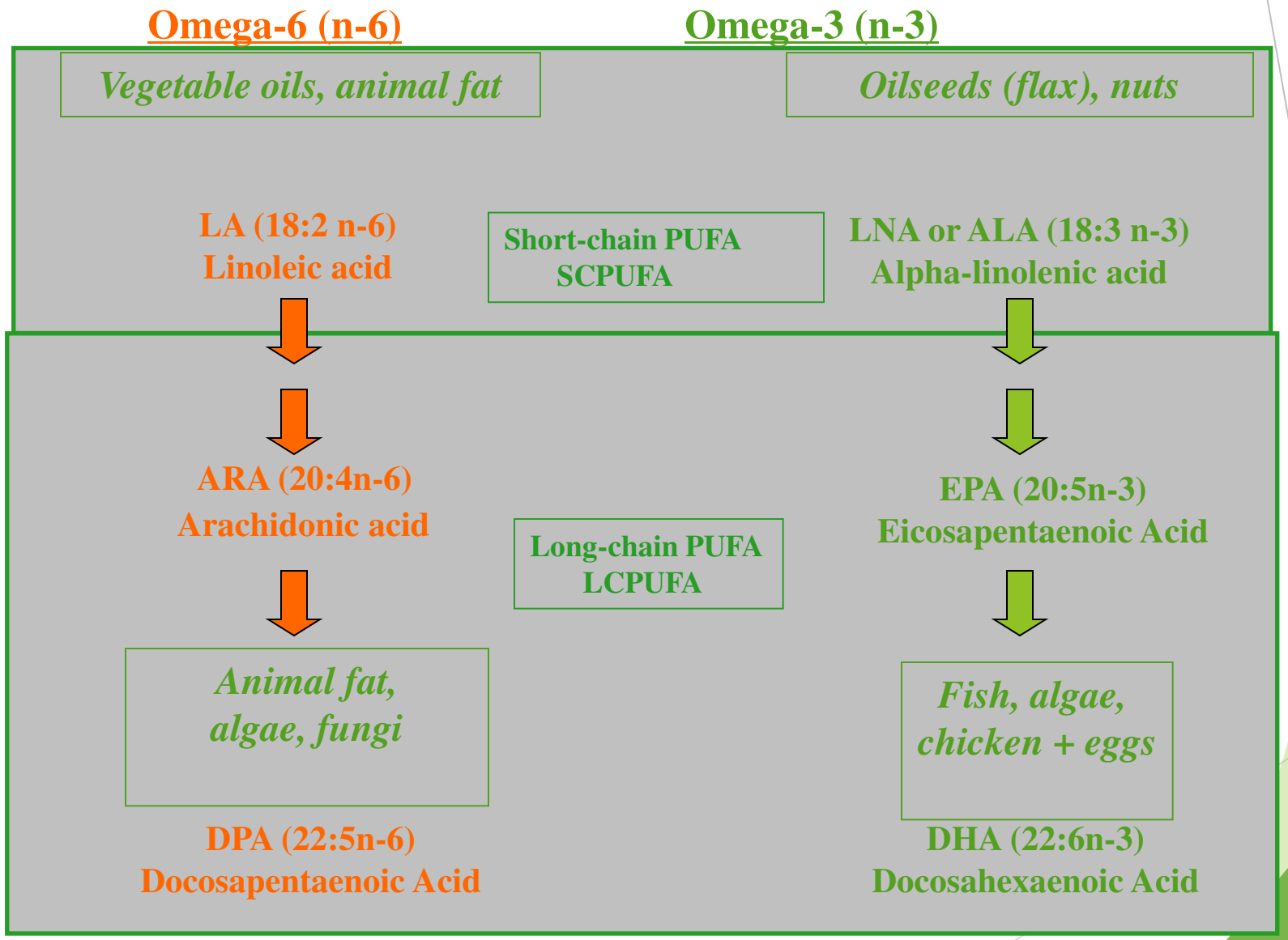

*Abbreviated cascade

Why Fortification?

- Competition for desaturase
- Poor conversion of ALA to DHA – 1 to 9 %
- Conversion decreases with ageing
- Vegetarians are challenged

Omega 3 Vehicles

- Oil
- Microencapsulated oil
- Novel vehicles

Challenges in Omega 3 fatty acid fortification

- Oil soluble
- Shelf stability
- Taste and odour

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Omega 3 oil

- The DHA and EPA content varies with source

Fish Oil	Algal Oil
• Higher Pay load • EPA and DHA • Non Vegetarian • Fishy odour	• Lower Pay load • DHA • Vegetarian • Marine odour

- Ideal for products containing oil or oil emulsion
- Antioxidants
- Emulsifying and stabilizing agents

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Omega 3 Oil

- Use of metal chelators
- Use of flavours to mask
- Use of Homogenizers and de aerators in the process
- HTST or UHT process

Omega 3 oil in foods

- Fluid Milk
- Flavoured milk
- Flavoured Yoghurt and youghurt drink
- Smoothies – Spoonable – fortified- for children
- Ice cream and frozen desserts
- Fat spreads, Peanut butter
- Emulsified sauces and dips – like mayonnaise

Omega 3 oil in Foods

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- Water based beverages – use of hydrocolloids to stabilize oil in water emulsion
- Chocolates
- Bread
  - Withstands the baking temperature
  - 90% Recovery is reported

Omega 3 – Encapsulated

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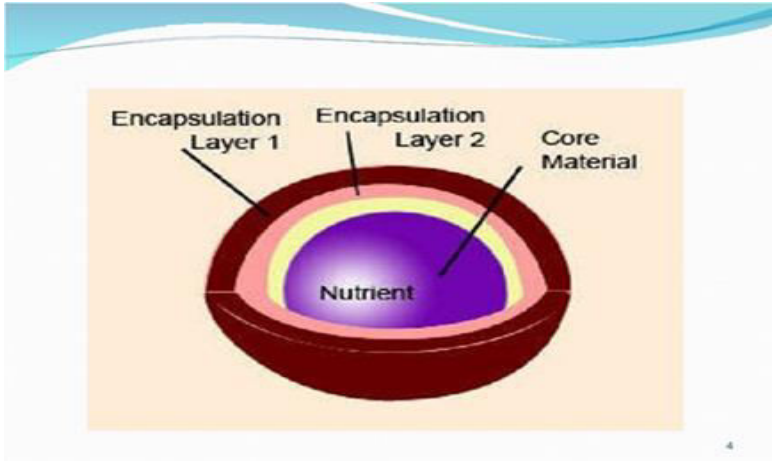
- an omega-3 core is packaged within a secondary material to form a microcapsule.
- Multilayered



- Starch derivatives, gums, proteins, etc form the outer layers
- Encapsulation is carried through
  - Spray drying.
  - Spray Freeze Drying – low temperature and higher retention

Methods of Encapsulation

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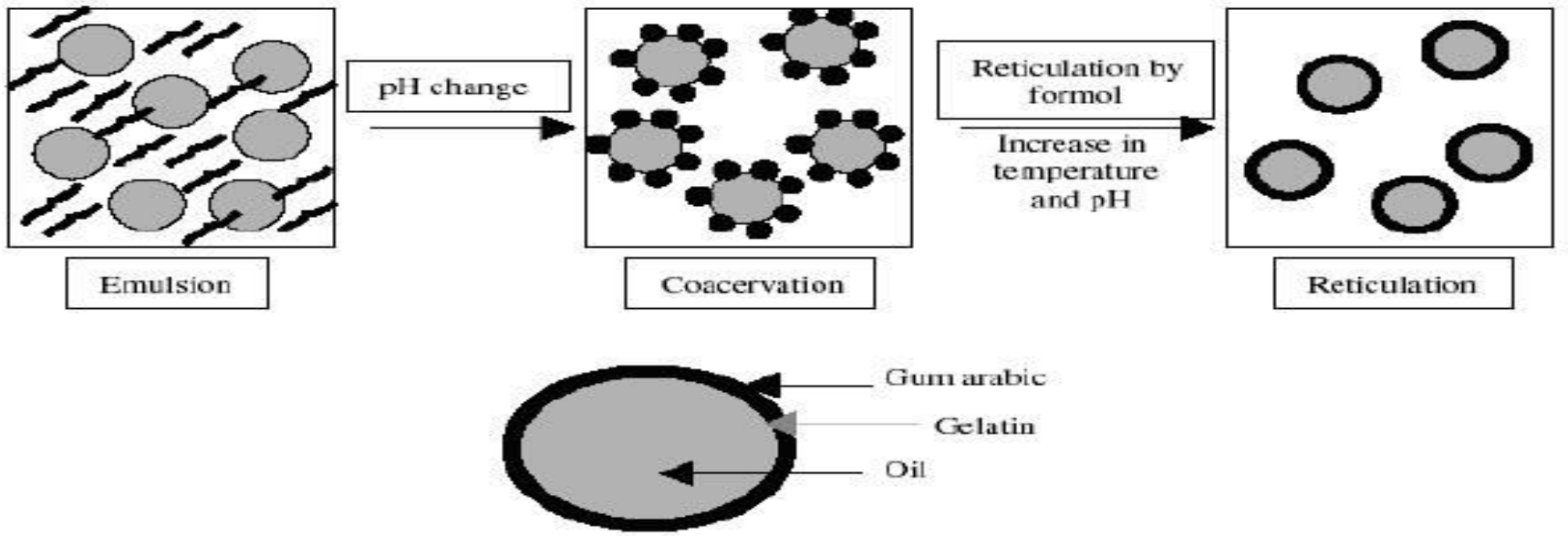
- Conventional
  - An oil in water emulsion stabilized protein and hydrocolloids
  - Spray drying
  - Surface fat
  - Not very protective
  - Flavour issue may persist
- Coacervation
  - Emulsion formation in presence of a cationic (protein) and anionic (gum) polymer
  - pH alteration to coacervate
  - Spray drying
  - Better encapsulation with sustained release

Coacervation



Methods of Encapsulation

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- Cyclodextrin Complexation – Inclusion of omega 3 fatty acid within the cyclodextrin molecule
  - Additional advantage of flavour modification
- Nano encapsulation
  - Binding with Beta lactoglobulin
  - Water miscibility

Encapsulated Omega 3 Powder

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- Powder form – Higher stability
- Facilitates incorporation in products
  - With no fat
  - Directly consumed
  - Dry blended products
- Marine or fishy note on reconstitution – sustained release would help
- Pay load is less – 10% to 20%
- Expensive

Encapsulated Omega 3 in Foods

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- Powders to be consumed after dilution
  - Infant Formula – No flavour is permitted
  - Health beverage mixes
- Functional and Nutritional Bars
- Breakfast cereals

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Encapsulated Omega 3 in Foods

- Bread
- Dairy Products
  - Yoghurts
- Chocolates
- Coated nuts and cereals
  - Museli
  - BARs

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Other vehicles of Omega 3

- Softgel capsules
  - Small and soft elastic chewable forms
  - Containing the fatty acids.
  - High protection
  - Could be vegetarian capsules
  - Ideal for incorporation in chewable tablets and gummies
- Granulation , Tableting and Coating – coated confectionery

Summary

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- Omega 3 incorporation – A challenge
- Newer vehicles
- Product ingredients and process to be finalized.
  - Does it have fat?
  - Can flavour be added ?
  - Are anti oxidants permitted ?
  - Dry blending or spray dried or others?
- Appropriate source to be selected
- Shelf life studies

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- Thank you