Application in oils and fats

- nanocapusles of tuna fish oil to add Omega-3 fatty acids in bread .

Nanoemulsion

- oil-in-water (o/w) emulsions
- Usually, the average droplet size is between 100 and 500 nm.
- preparation requires high-pressure homogenization
- Nanoemulsion: Lipid monolayer enclosing a liquid lipid core
- more suitable for carrying lipophilic compound.

Nanoemulsion application

- *Food science Australia*
- *high clarity*
- *Adding to a beverage without a change in product appearance.*
- *process challenging because of limitations on the type of surfactants*
- *nanoemulsions : small size and low surfactant to oil ratios*

Lipid nanoparticles

- Pharmaceuticals
- Cosmeceuticals
- nutraceuticals industries

Lipid nanoparticle

- Lipophilic compounds are incorporated into nanostructured lipid carriers .

- for optimising drug incorporation and modifying drug release.

Lipid nanoparticles

- similar structure to nanoemulsions
- Lipid core in lipid nanoparticles is in the solid state .
- Adding surfactants or polymers to stabilize the solid lipid particle.

Lipid nanoparticles benefits

- Improved stability of chemically unstable active ingredients
- Controlled release of active ingredients
- Good physical stability

Lipid nanoparticles

- Encapsulate other substances for delivery.
- Nano-sized Self-assembled Liquid Structures (NSSL) technology to deliver nutrients in nanosized particles to cells.
- Increasing bioavialability

Lipid nanoparticles

- Lycopene
- beta-carotene
- lutein
- phytosterols
- CoQ10
- DHA/EPA .

Lipid nanoparticles

- Nutralease Company in Israel:
- nano-sized liquid vehicles and technology for solubilisation of nutraceuticals in foods.
- creation (with Shemen Industries Ltd. Haifa, Israel) of Canola Active: Canola oil fortified with free phytosterols for reducing human cholesterol.

Lipid nano particle

- application of nanostructuring materials developed by Danisco ,Denmark to stabilize emulsions of liquid oils.
- edible surfactant emulsifiers allow formulation of trans-fat free liquid oils for baked goods.
- Emulsification reduces the interaction of oils with the proteins in applications like cake mixes.

Lipid nanoparticles

- water-soluble omega-3 fatty acid designed for nutraceutical, cosmeceutical and cosmetic applications (report by
)

Lipid nanoparticles

- an omega-3 fatty acid with an average particle size of 34 nanometers.
- Much smaller particles can be more easily absorbed
- Enhanced bioavailability

lipid –coated polymer nanoparticles

- A biodegradable hydrophobic polymer forming a core,
- An outer amphiphilic layer surrounding the polymer core containing a stabilizing lipid are suitable for delivering active agents.

lipid –coated polymer nanoparticles

- Fluorouracil (5-FU) :
- tumor-killing activity
- but adverse side effects .
- lipid-coated polymer nanoparticles may alter the balance between efficacy and toxicity.

lipid –coated polymer nanoparticles

- can be breathed into the lungs
- may be useful for delivering sustained doses of 5-FU for treating lung cancer.

Summary

- To design food with much more capability
- lower costs
- production more efficient
- improve shelf life, taste
- offer health benefits

Future work

- a lot of new ideas will be required in order to succeed in this growing market in future
- more needs to be done in oils and fats industry.

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Thank you for your attention