

How to Reduce Dietary Fat in Food Products

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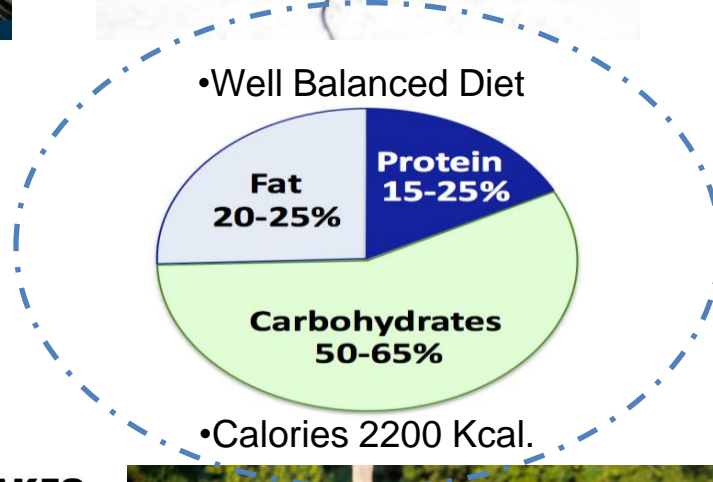
Dietary fat plays an important role in a healthy diet.

Nutrient	Primary Functions
Water	Dissolves and carries nutrients removes waste and regulate body temperature
Protein	Builds new tissues, antibodies , enzymes , hormones and other compound
Carbohydrate	Provide energy,
Fat	Provided Long term energy, increases absorption of fat solution Vitamins
Vitamins	Facilitate use of other nutrients, involved in regulating growth and manufacturing hormones
Minerals	Aid in muscle function and nervous system activity

Due to increasing Sedentary life it is more important to have proper nutrition and regular physical activity to improve quality of life.



Adopting to well
Balanced diet
and



active lifestyle....

THE DIFFERENCE EXERCISE MAKES

Only about 20 percent of American adults meet their recommended amount of exercise, but skipping on regular sweat sessions has some pretty profound effects. Here are a few of the major differences between an average, 40-year-old exerciser and someone getting little to no physical activity.

SEDENTARY PERSON	REGULAR EXERCISER
SLEEP QUALITY 56% say they get fairly or very good sleep	SLEEP QUALITY 83% say they get fairly or very good sleep
AVERAGE RESTING HEART RATE 60-80 beats per minute	AVERAGE RESTING HEART RATE 40-60 beats per minute
MAXIMAL OXYGEN UPTAKE* Women: <25 Men: <30	MAXIMAL OXYGEN UPTAKE* Women: 46-50 Men: 48-53
AVERAGE DAILY CALORIE NEEDS Women: 1,800-2,000 Men: 2,000-2,600	AVERAGE DAILY CALORIE NEEDS Women: 2,000-2,400 Men: 2,400-3,000
LIFE EXPECTANCY The average American lifespan is 78.7 years	LIFE EXPECTANCY About 4 years longer
SWEAT Sweat less efficiently	SWEAT Start sweating sooner

Sources: CDC, WebMD, USDA, Men's Journal, Harris Training Systems, ABC News Photos: Getty

THE HUFFINGTON POST



Fats are good

Why Oils and Fats

1

Concentrated Source of energy
9 Kcal/gm

2

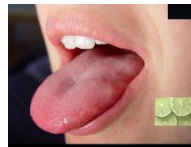
Source of essential fatty acids
C 18-2, C 18-3

3

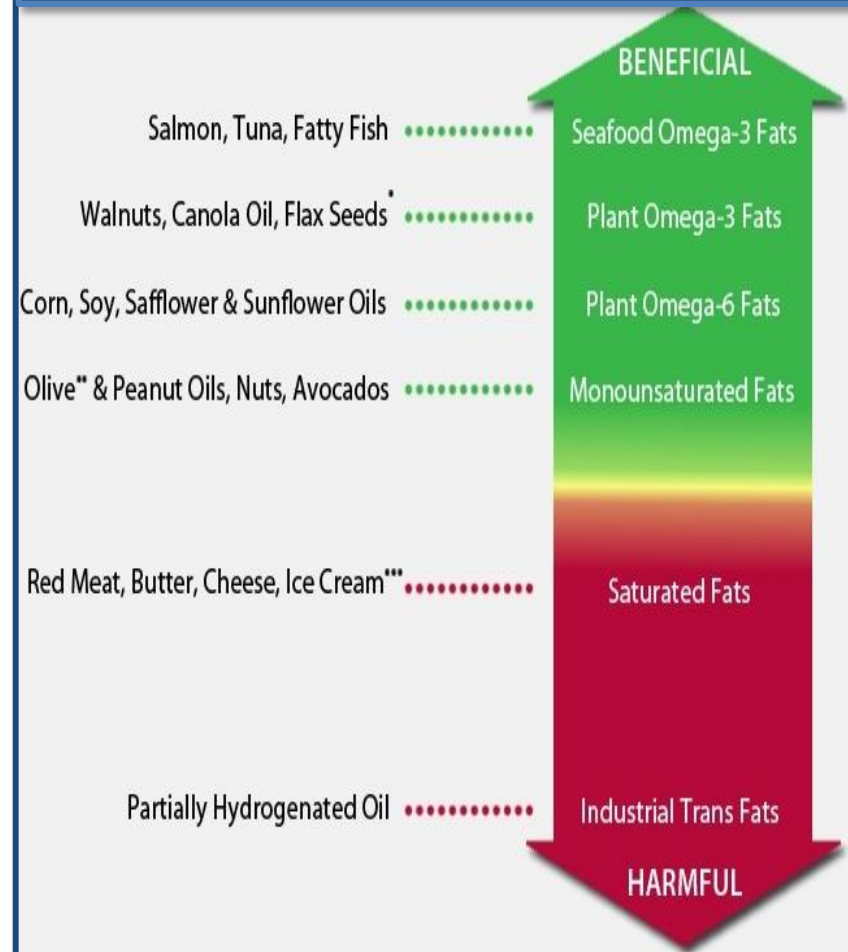
Carrier of fat soluble vitamins
Vit A, D, E & K

4

Contribute to texture and great taste



Source of Fats



Strategies to reduce fats in Foods

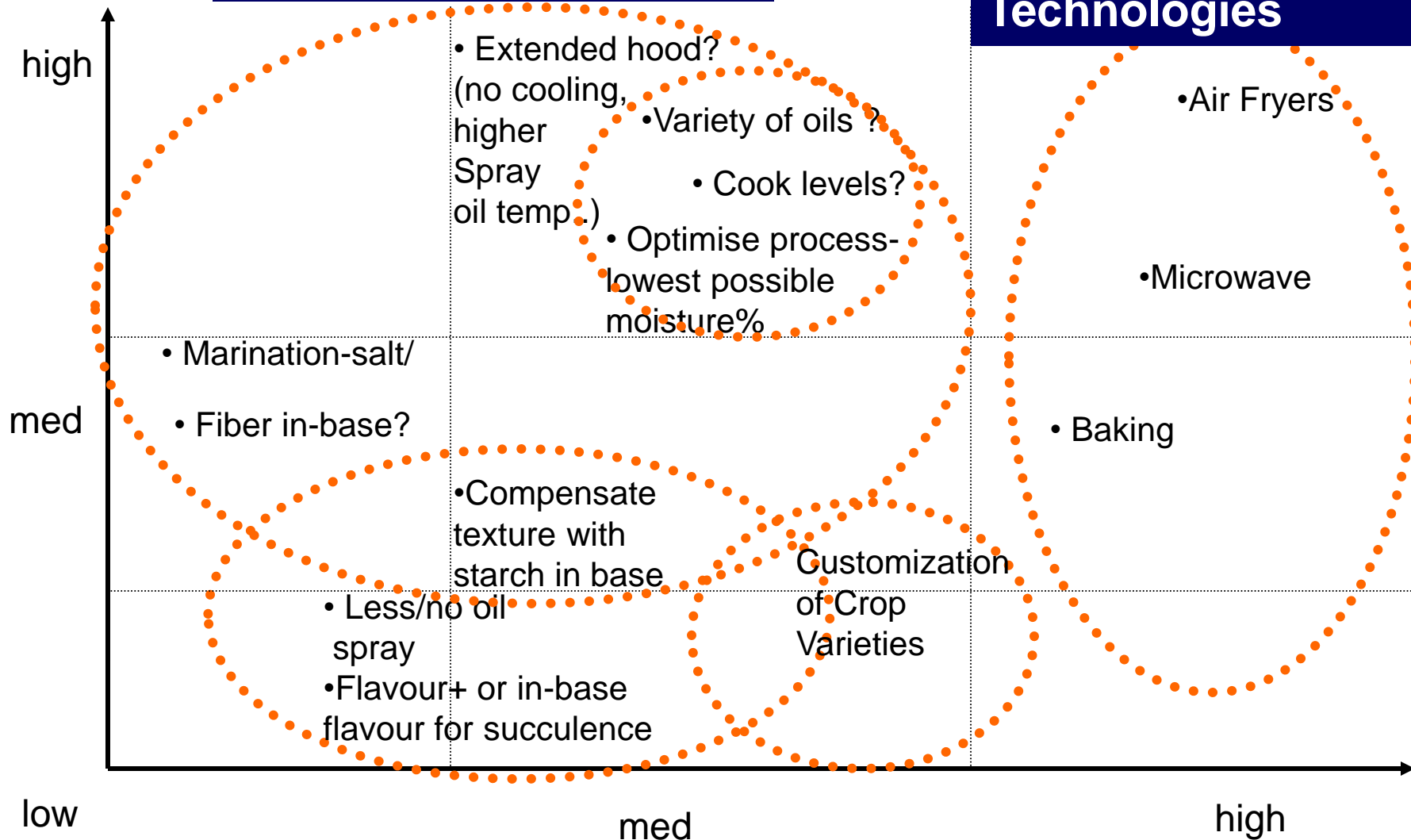
1 Product Innovation	2 Process Modification	3 Value added Ingredients	4 Equipment Technologies
Creation of low calorie product formats . Milk , Skim Milk etc	Optimization of Process parameter to optimize Oil Absorption	Fats Mimics , Flavor modulators	Baked Products
Inclusions of fats mimics in dough, to reduce fat content	Striping oil from Capillary formation facilitating draining oil	Enzyme Technology	Air Fryer
Usage of oil variety specific to low absorption	Reducing surface moisture from the products	Spices/ Salt in the dough help retaining moisture in the product	Oil Striping Mechanisms
Differentiated Formulations	Coating techniques	Salt/ brine treatment	Vacuumed fryer

Technology width / Solutions

TECHNICAL COMPLEXITY(WIP)

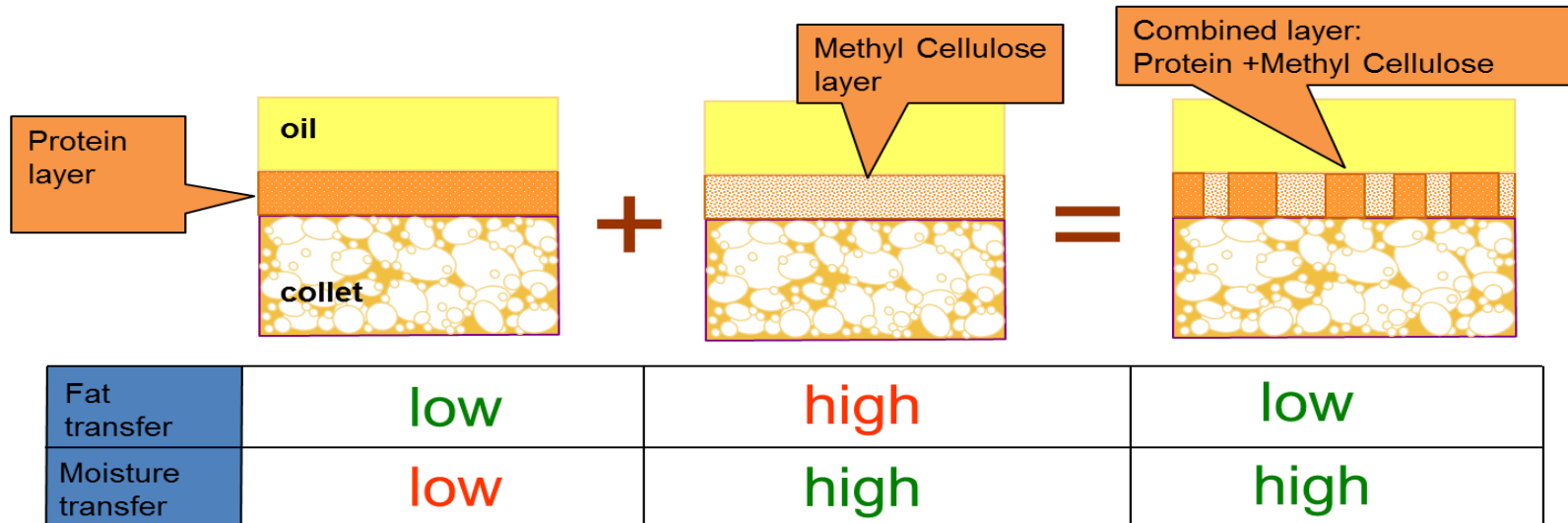
Standard Technologies

Advance Technologies



INVESTMENT / DEVELOPMENT COST

Comparative evaluation of edible coating ...



Comparative evaluation of edible coatings to reduce fat uptake in a deep-fried cereal product. Susanne Albert, Gauri S. Mittal. Food Research International 35 (2002), pp. 445–458



With lecithin mixture a 3-5% total fat reduction can be achieved with no flavor trade-off

Air swipe to remove excess water from food



Baking Oven



Air Fryer Model

Mexico, LATAM, AMENA

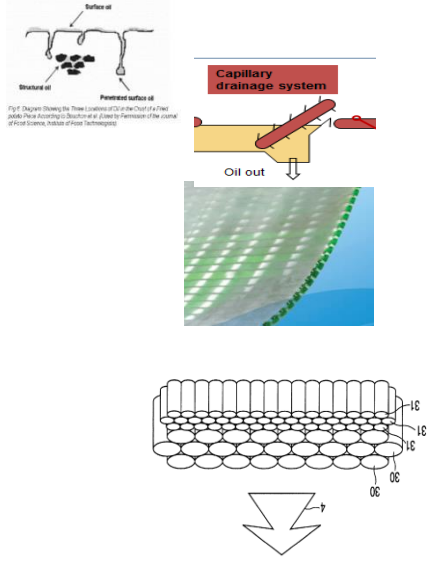
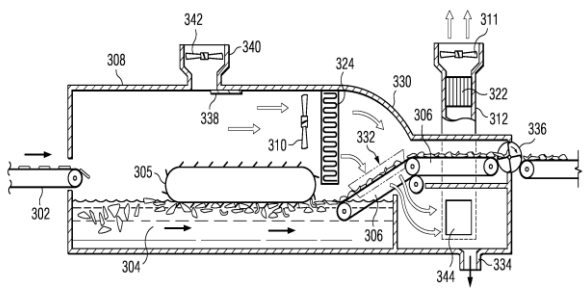


Methods of Fat Reduction in Food products

Vacuum Fryer



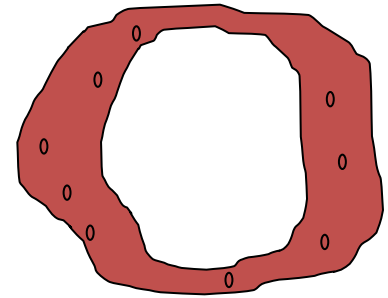
Natural oil stripping form continuous fryer



Flavor technology can play important role to reduce Fats.....

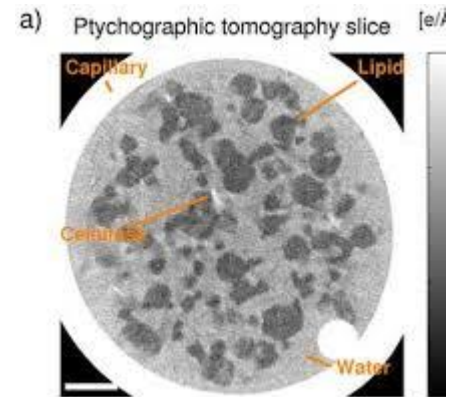
A High Speed Particle Implantation System

To locate some powdered oil mimics inside the product base prior to the use of conventional seasoning systems



Low oil and great eating experience

Example - Doughnuts that contained the soybean-hull fiber absorbed 11-36% less fat during deep-fat frying than conventional doughnuts,



Fat Mimics - provide fewer calories per gram than fat

Carbohydrate Based Fat Mimetics

Energy density - 4 kcal./g

Regular Mayonnaise	Low Fat Mayonnaise
90 calories	15 calories
	By using Maltodextrins

Vs



Protein Based Fat Mimetics

Energy density of 4 kcal/g.

Microparticulated proteins absorb water and can be used in lower amounts than fat

Xanthan gum and Whey protein complexes in Candies and icecreams

Fat Based Based Fat Mimetics

Energy density of 5-6 kcal/g.

Not fully absorbed or metabolized in the body.

Example
Salatrim (Benefat®) which has been used to substitute for fat in chocolate cake (115).



Enzymes can help in fat reduction basically mimicking the functionality of the fat

For example: fat reduction in biscuit using enzymes



Fat in recipe helps to reduce the **gluten development** and makes softer dough and end product it gives good mouth melting characteristics

• **Enzymes**
combination of like protease and /or Lipase can get softer dough and avoid gluten development and can provide similar experience

The emulsifiers
produced by lipase enzymes can also complex with amylose increase the gelatinization point that also help to change the texture of product.

Few more techniques for fat reduction in finished products

- **Fat replacement** –Avocado puree fat content can be reduced from few of the bakery products by 20- 35%,
- **Brining** – Osmotic dehydration causes increase in concentration of solids and less water to create pores.
- **Gums** – Hydrophilic soluble fibers forms viscous solutions and films on surface upon heating and dehydration that prevent oil penetration in to surface pores.
- **Thick Slices** - Lower surface area to weight ratio – Oil present on surface of chip as it is dragged from the hot oil is limiting factor for oil absorption.
- **Extended Hood technology** - Oil is absorbed in to products as they cool. Having a covered, insulated take out conveyor allows the product bed to remain hotter for longer, facilitating additional oil drainage

Consumer acceptance of the reduced fat products in key!

- Consumers continue to expect same Great taste experience delivered in products with lower fat
- Consumers awareness and understanding about nutritional parameters will help them to make informed choices.
 - ▶ Many studies show consumers main focus on MRP, Shelf life, Net Quantity...

... while trying to maintain the same eating experience!

Oil

Regular



30-40%



>70%



Sugar

Regular



Mid-cal 50%



Zero-cal



Salt

Regular



25%



Thanks