

Glycaemic Index

Theory, Practice and Applications

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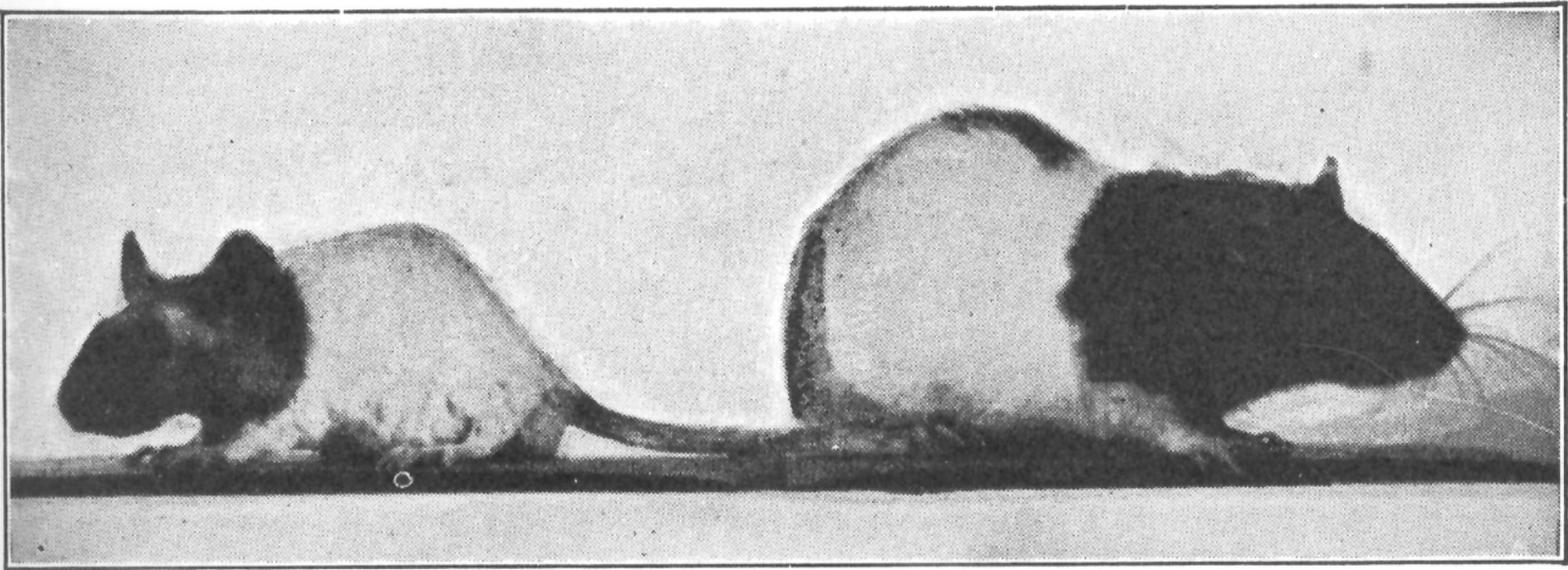
Oxford Brookes University


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A nutritional paradox

- All foods are composed of protein, fat and carbohydrate
- 1911 - importance of protein quality identified (Osborne & Mendel)
- 1932 - effect of differences in fat composition identified (Burr & Burr)
- It was not until **1981** that metabolic differences in carbohydrates were recognised (Jenkins et al, 1981)
- Why?

Influence of Protein quality on Rat Growth





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- Fruits, nuts, bran, legumes, lentils, salads, vegetables, dry fruits, low-fat yogurt, wholemeal bread, pitta bread, basmati rice and most whole grains.
 - These are called healthy food options!

- All these healthy foods are also low-glycaemic (GI) foods (<55)!
- To me, therefore, low-GI foods are merely a proxy indicator of all foods ascribed to be “healthy”

The Food Guide Pyramid

A Guide to Daily Food Choices

KEY

-  Fat (naturally occurring and added)
-  Sugars (added)

These symbols show fat and added sugars in foods.

Fats, Oils, & Sweets
USE SPARINGLY

Milk, Yogurt,
& Cheese
Group
2-3 SERVINGS

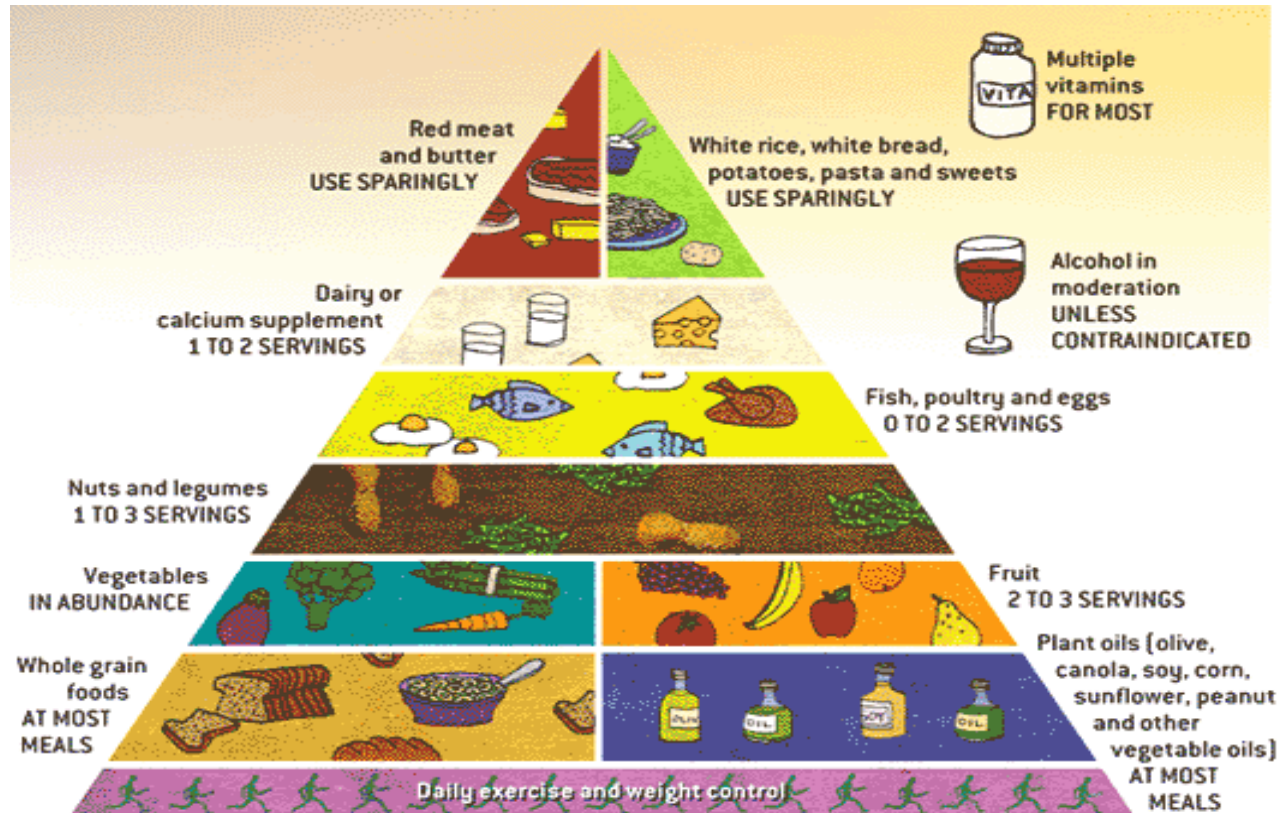
Meat, Poultry, Fish,
Dry Beans, Eggs,
& Nuts Group
2-3 SERVINGS

Vegetable
Group
3-5 SERVINGS

Fruit
Group
2-4 SERVINGS

Bread, Cereal,
Rice, & Pasta
Group
**6-11
SERVINGS**

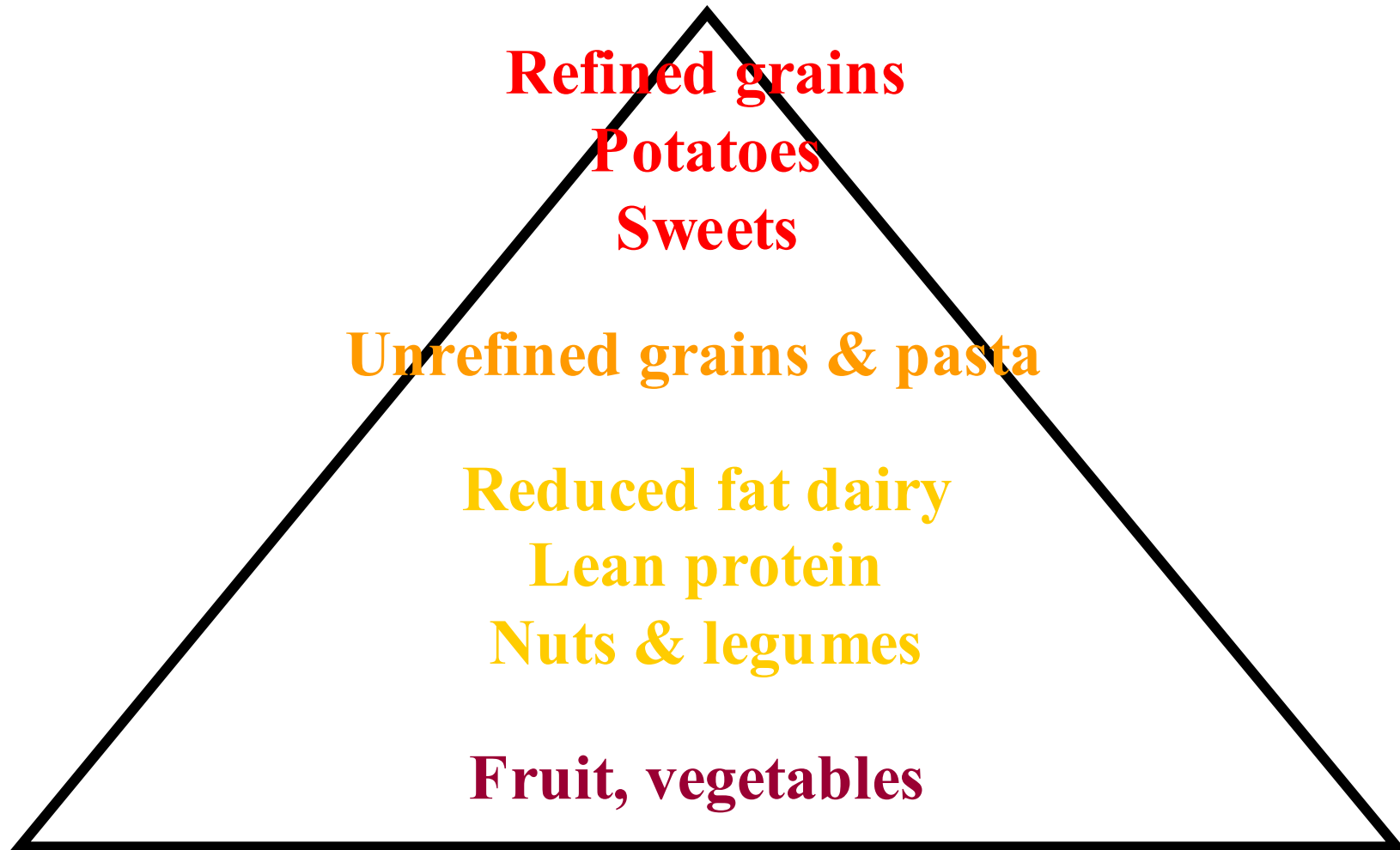
Low-GI pyramid (after Willet et al, Harvard University)




NEW FOOD PYRAMID

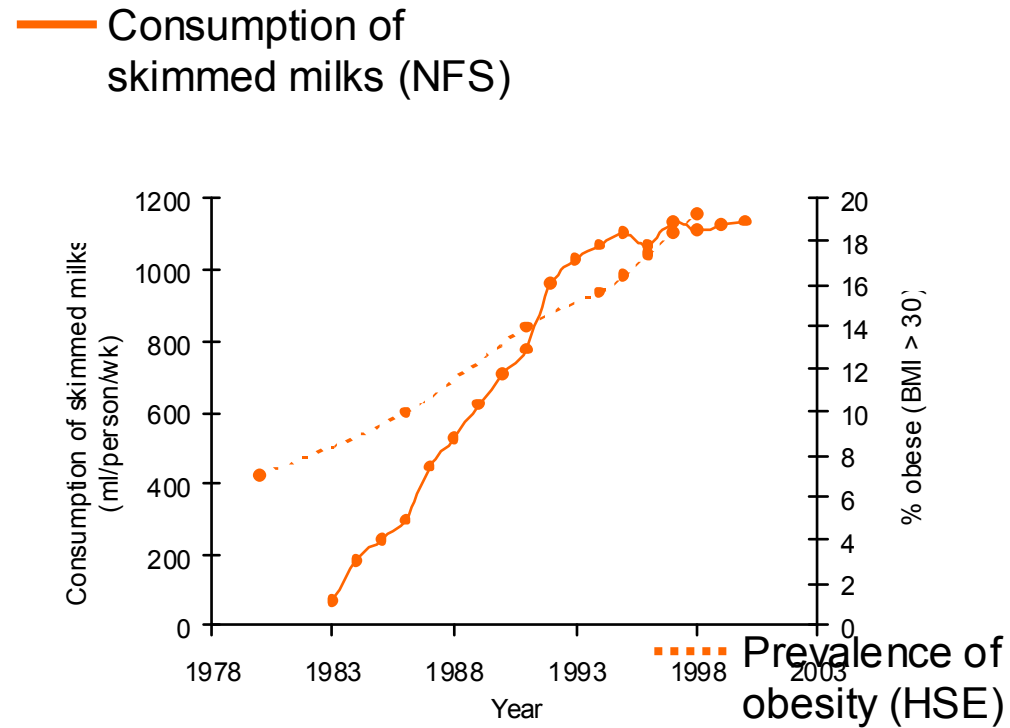
outlined by the authors distinguishes between healthy and unhealthy types of fat and carbohydrates. Fruits and vegetables are still recommended, but the consumption of dairy products should be limited.

Low-GI pyramid (after Willet et al, Harvard University)



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- A major public health concern is obesity and weight loss
 - Several diets proposed
 - Low-fat
 - Atkins
 - The Zone Diet
 - South Beach Diet
 - The Cabbage Diet
 - Blood group Diet
 - Most of these diets are ineffective in the long term
 - A low-GI diet seems promising...

Prevalence of obesity in adults and consumption of skimmed milks



NFS = National Food Survey
HSE = Health Survey for England

(Henry & Lightowler, 2002)

What are the benefits of a low-GI diet?

- Low-GI foods:
 - enhance satiety and keep you feeling full for longer
 - improve insulin sensitivity
 - can assist with weight loss
 - appear to reduce fat deposition and enhance fat mobilisation
 - There is NO evidence of any negative health effects of GI

GI values for some foods tested at oxford Brookes University laboratory

- Corn flakes - 90
- Puffed wheat (sample A) - 75
- Puffed wheat (sample B) - 60
- Finger millet - 64
- Bread (sample A) - 70
- Bread (sample B) - 55
- Toast (white) alone - 65
- Toast (white) with baked beans - 50
- Pasta (wholemeal) - 45
- Pasta (wholemeal) with tomato sauce & olive oil - 35

Food factors that influence glycaemic response

- Nature and amount of carbohydrate
- Nature of the monosaccharide components
 - glucose
 - fructose
 - galactose
- Nature of the starch
 - amylose
 - amylopectin
 - starch-nutrient interaction
 - resistant starch
- Cooking or food processing
 - degree of gelatinisation of starch
 - particle size
 - food form
 - cellular structure
- Other food components
 - fat and protein
 - dietary fibre

GI: A rival to Atkins?

- Recently Leatherhead Food International held a conference with the theme “GI: a Rival to the Atkins Reign”
- My proposal: That GI and Atkins should be in holy matrimony!

Conclusion

- The future is bright for GI
- The challenge ahead is for the food industry, retailers, and nutritionists working together to develop low-GI food products that are palatable, exciting to eat and also have a health benefit