

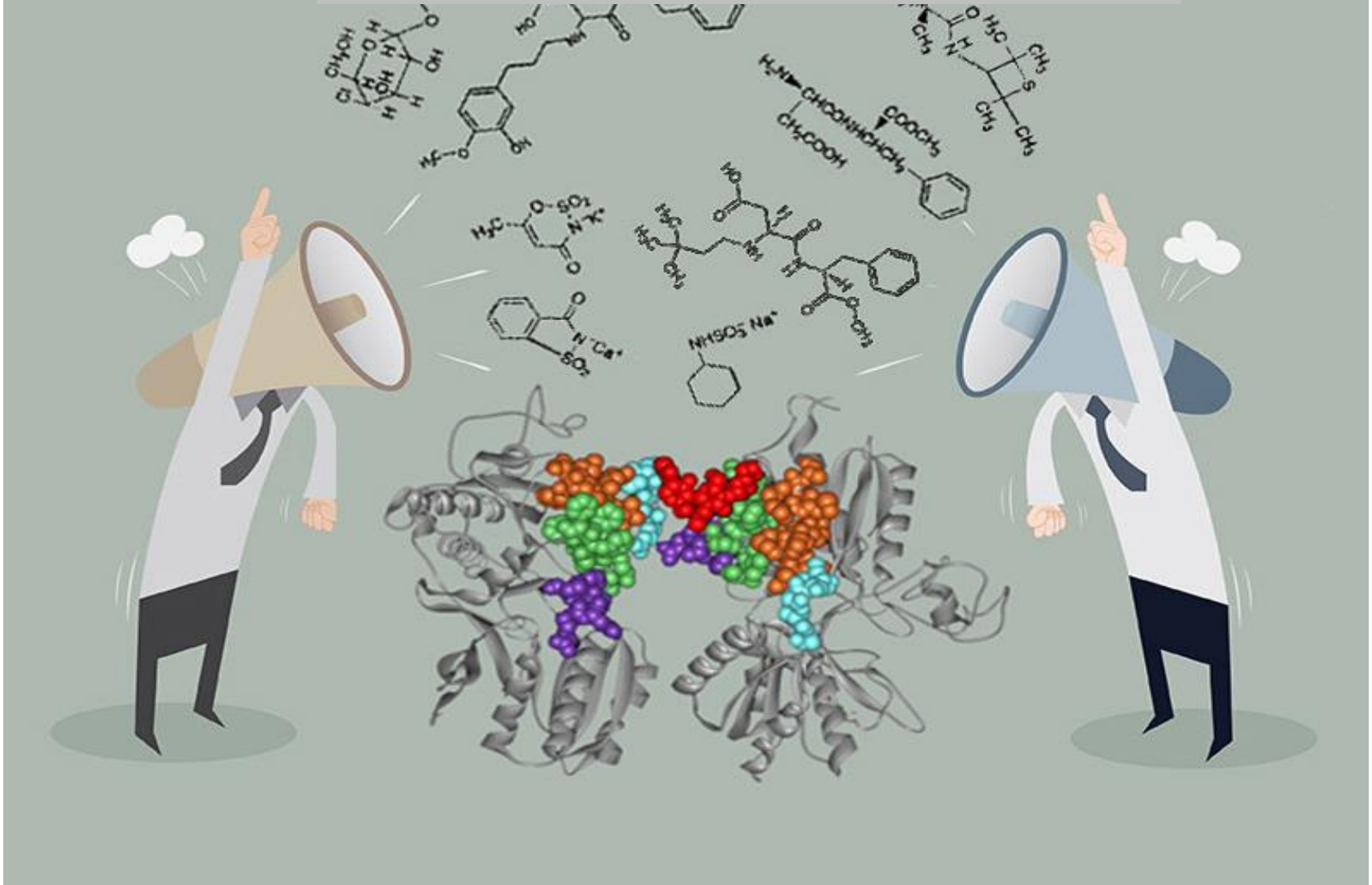
What do I do.

I lecture in the following subjects:

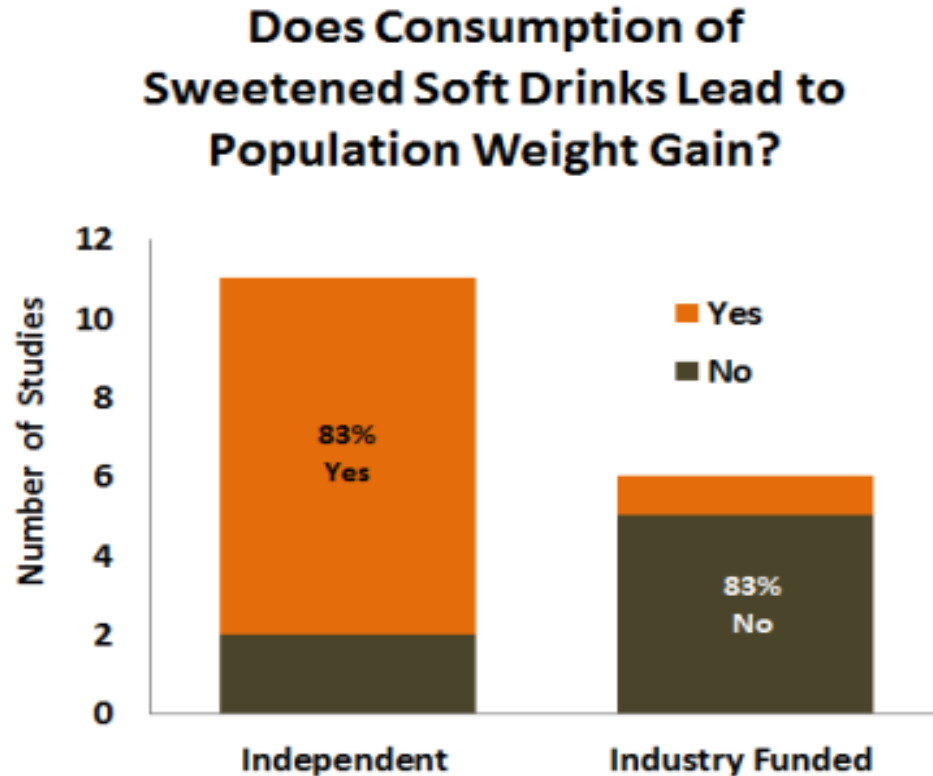
- Biochemistry
- Human Nutrition (incl. Sustainability)
- Diet and Disease



Complete or incomplete protein, that is the question.
Repercussions for a sustainable food system.



This simple chart explains the devastating influence industry may have on scientific integrity.



Putting the food industry at the policy table is like putting Dracula in charge of the blood bank.

PLOS MEDICINE Financial Conflicts of Interest and Reporting Bias Regarding the Association between Sugar-Sweetened Beverages and Weight Gain: A Systematic Review of Systematic Reviews Maira Bes-Rastrollo et al Published: December 31, 2013 DOI: 10.1371/journal.pmed.1001578

Which statement about sources of protein is false?

- A. Animal and plant sources of protein are used efficiently by the human body .
- B. It is difficult to meet most people's protein requirements without consuming animal proteins.
- C. Most plant sources of protein contain all the essential amino acids.

Plant Proteins in Human Nutrition—Myths and Realities

| Myth | Reality |
|---|--|
| Plant proteins are not complete; they lack certain amino acids. | Most dietary combinations of proteins are complete; certain food proteins may be low in specific amino acids. |
| Plant proteins are lower in quality than animal proteins. | Protein quality depends not only on the source but also on the dietary mixture of plant proteins; plant proteins can be as high in quality as animal proteins. |
| Proteins from different plant foods must be carefully mixed and eaten together in the same meal. | Proteins do not have to be eaten at the same meal; the mixture over a day is important for nutritional value. |
| Information derived from animal procedures or experiments can provide a reliable guideline of the human nutritional value of food proteins. | Animal procedures may underestimate plant protein quality for humans. |
| Plant proteins are difficult to digest. | Depending on the source and method of food preparation, plant proteins can be easy to digest. |
| People cannot meet protein needs with plant proteins alone. | Plant protein or animal protein can provide adequate protein for human needs. |
| Plant proteins are lacking in nutritional value because they are not balanced. | Plant proteins do not create a practical problem in terms of balance; possible imbalances are observed in amino acid supplementation. |

Complementary food combinations

Table 6.2

Complementary Food Combinations—Turning **Incomplete*** Proteins into **Complete Proteins**

| Food | Limiting Amino Acid | Foods High in Limiting Amino Acid | Complementary Food Combination |
|------------|------------------------------|---|--|
| Legumes | Methionine and cysteine | Grains, nuts, and seeds | Rice and lentils Red beans and rice Rice and black-eyed peas Hummus (garbanzo beans and sesame seeds) |
| Grains | Lysine | Legumes | Peanut butter and bread Barley and lentil soup Corn tortilla and beans |
| Vegetables | Lysine, methionine, cysteine | Legumes (lysine); grains, nuts, and seeds (methionine and cysteine) | Tofu and broccoli with almonds Spinach salad with pine nuts and kidney beans |

The above is what the textbooks say – are they wrong*?

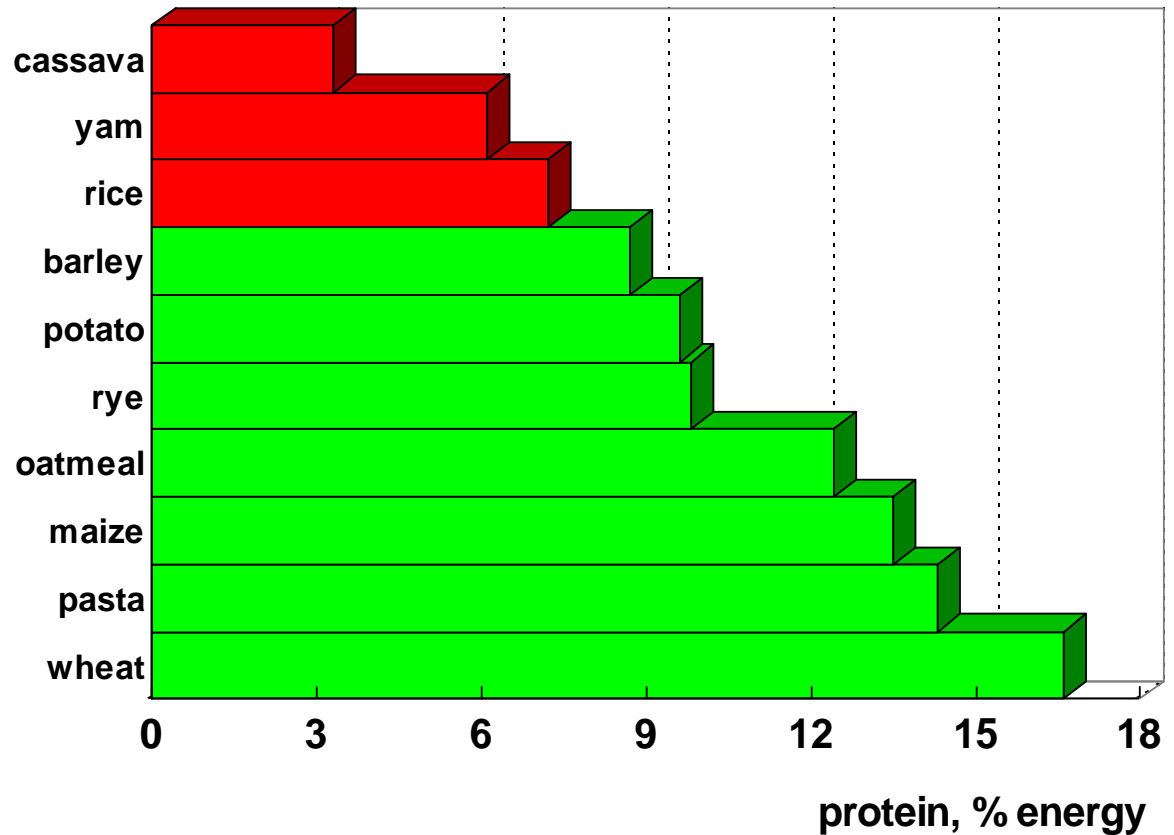
The 1988 position paper of the American Dietetic Association - Complementation

- Emphasized that, because amino acids obtained from food can combine with amino acids made in the body, it is not necessary to combine protein foods at each meal. Adequate amounts of amino acids will be obtained if a varied vegan diet - containing unrefined grains, legumes, seeds, nuts and vegetables - is eaten on a daily basis.
- It has been shown that diets based solely on plant sources of protein can be quite adequate and supply the recommended amounts of all essential amino acids for adults, even when a single plant food, such as rice, is virtually the sole source of protein. The American Dietetic Association emphasizes that protein combining at each meal is unnecessary, as long as a range of protein rich foods is eaten during the day.
- *Havala, S. and Dwyer, J. (1988). 'Position of the American Dietetic Association: vegetarian diets - technical support paper', J. Am. Diet. Assn., 88, 352-355.*

Protein deficiency is unlikely in an adult

Safe and adequate protein intake is 8.25 % of energy intake

If you can eat enough of most “starchy” staples to meet energy needs you will meet your protein requirements



Protein requirements

Recommended average daily protein requirement = 0.66g/kg body weight.

- But RNI allows for individual variation so the reference intake = 0.8g/kg body wt.
- **OR** 56 g/day for 70 kg adult
- But in **developed** countries average intake is 80-100g/day
- Protein requirements of adults are met when the diet provides 8-9% protein energy/day.
- But in Western countries it provides 14-15%.

Global warming: WHO – Livestock's long shadow:

- Report claims eating meat causes almost 40% more greenhouse gas emissions than all transport in the world combined.
- Concludes meat industry "should be a major policy focus when dealing with problems of land degradation, climate change, air pollution, water shortage and water pollution, and loss of biodiversity.'
- Lancet recommends we reduce meat consumption to 90 grams/day which in UK/EU is a 60% cut.

U.S. Department of Agriculture says:

- *"The types and amounts of food an individual chooses to eat not only affect his or her well-being, but also have implications for society as a whole."*



Friends of the Earth in Europe

- ***"Diet is no longer a private matter. Every time we eat, we are making a political choice, and we are impacting upon the lives of people around the world, on the environment, biodiversity and the climate. Huge amounts of resources go into the food on our plates. Sustainable alternatives exist to the dominant destructive, corporate-controlled and intensive global system for producing and consuming meat."***



To the best of my knowledge, none of the current recommendations for protein intake allows for, or considers, the environmental impact of meat consumption in the West.



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