

**Report of a Sub-Committee of the 2011 FAO Consultation
on “Protein Quality Evaluation in Human Nutrition” on:**

**Assessing a data set on true ileal amino acid digestibility
of foods for humans (prepared by a Sub-Committee
chaired by Dr Sarwar Gilani), including assessing its
suitability for practical application in the calculation of
DIAAS values and the implications of these data
for the final Consultation report.**

Members of the Sub-Committee:

*Ricardo Uauy (Chair), Joe Millward, Paul Pencharz, Malcolm Fuller and
Barbara Burlingame (ex officio)*

NOTE: the matters expressed in this report are those of the Sub-Committee and do not necessarily reflect the opinions of members (or a consensus) of the Expert Consultation. The report was an integral part of the process, in achieving an overall consensus, as relayed in the overall report of the 2011 FAO Expert Consultation.

The following consensus statement was received by the Sub-Committee chaired by Dr Sarwar Gilani¹:

1. Agree on the concept that ileal digestibility in principle is preferable to faecal digestibility for the purpose of defining indispensable amino acid digestibility and assessing protein quality of dietary protein sources for humans.
2. Recognize that there is a fair body of evidence on ileal amino digestibility in rats and pigs but that there was limited data on amino acid digestibility in humans; very few studies compared the amino acid digestibility of the same protein sources in animals (rats, pigs) and humans. These type of studies are badly needed in order to be able to support moving to ileal digestibility in the assessment of human protein digestibility.
3. Future studies should include comparisons of digestibility values across the different models using protein sources that are representative of those consumed by human populations.
4. If the data obtained from these studies (as specified under # 3 above) convincingly support the move to ileal digestibility assessment of the potential impact of this recommendation to be used in the assessment of individual protein sources as well as mixed diets commonly consumed by humans need to be undertaken before the new evaluation model is implemented. This should include potential gains and or losses to public health, derived from the implementation of the new recommendations on assessment of protein quality for humans.

R Uauy
Chair, Sub-Committee

April, 2012

¹Further notes from the Uauy Sub-Committee that were received in response to the initial report from the Gilani Sub-Committee are attached. Note that subsequent to the initial report, a revised report taking into account comments from the Uauy Sub-Committee and including further data was presented by the Gilani Sub-Committee. The consensus statement presented above, is in response to the second and final report from the Gilani Sub-Committee (refer www.fao.org).

— Notes from the Uauy Sub-Committee —

Conclusions reached by Sub-Committee members

The members of the review panel were asked to reply to each of the following questions:

- a) **Have we made a good case for changing from faecal to ileal?**
- b) **Do we have current data that meet the best standards, and that are also relevant to humans on ileal digestibility to support the change (not of concept but of actual use of the data) from faecal to ileal?**
- c) **Have the experts examined fully the implications that this will bring to dietary protein quality assessment of individuals and populations?**
- d) **What will be the public health impact (positive and negative) (intended and unintended) and whether there is more to be gained than lost from the change?**
- e) **Have we conducted our review with full independence of our own personal interests and any outside interest in defining the answer to the question we were posed?**

The consensus responses of the members to the questions posed were:

- a) **Have we made a good case for changing from faecal to ileal?**

The scientific case for using ileal digestibility is sound but it derives almost entirely from work with animals. The data for humans amount to only a handful of observations encompassing a limited range of digestibility.

Theoretically yes, but based on the available data “no” with regard to humans due to the limitations and nature of the data presented. This is why we asked whether the data from Daniel Tomé’s group was missing.¹

Data are mainly derived from animal studies, no solid data to extrapolate to humans have been presented, and various human diets need to be tested across systems before a change can be supported.

In addition we considered that “digestibility” measures, either faecal or ileal, do not properly consider the metabolic availability of the dietary proteins (Maillard Reactions, for example).

- b) **Do we have current data that meet the best standards, and that are also relevant to humans on ileal digestibility to support the change (not of concept but of actual use of the data) from faecal to ileal?**

No not enough

¹Subsequently a revised report taking into account comments from the Uauy Sub-Committee was prepared (refer www.fao.org) and further data were presented by the Sarwar Gilani Sub-Committee including more information from the French group.

Before a system based on ileal digestible amino acids can be implemented the few direct observations of indispensable amino acid digestibility in humans need to be augmented by a much larger body of values predicted from pigs or rats. The only regression equation that seems to be available at present for the prediction of human from pig values does not permit robust predictions to be generated. No comparable prediction equation to generate estimates of human indispensable amino acid digestibility from rat data has been presented.

c) Have the experts examined fully the implications that this will bring to dietary protein quality assessment of individuals and populations?

We do not believe we have. Given the paucity of data it would probably be a rather speculative exercise. The implications of the proposed changes have clearly not been assessed, this is particularly relevant in light of past experiences with protein, where data from the wrong animal models were used to extrapolate to human populations.

d) What will be the public health impact (positive and negative) (intended and unintended) and whether there is more to be gained than lost from the change?

We are not aware that this has been examined. Because the data are so limited for ileal digestibility we consider it is too early to make a change. For an organization like the FAO representing the whole World a change will produce confusion. Before the change is made sufficient data on comparisons across animal species and humans are needed.

e) Have we conducted our review with full independence of our own personal interests and any outside interest in defining the answer to the question we were posed?

All members answered Yes.