

## Crushed and ground flax seeds more bioavailable

Crushing or grinding flaxseeds makes the enterolignans more bioavailable to humans, indicates a new study, which could have some bearing on their use in food and supplement products.

Plant lignans, of which flaxseed is a particularly good source, are converted into *enterolignans* (enterodiol and enterolactone) in the gastrointestinal tract. There is some evidence that *enterolactone*, a phyto-estrogen, may have a beneficial effect on prostate health, bone health, breast health, menopause symptoms, heart health, hair loss, acne and inflammation.

Researchers from the RIKILT-Institute of Food Safety in Wageningen, The Netherlands, conducted a small study to investigate whether the bioavailability of enterolignans is enhanced by crushing and milling the flaxseed.

Every day for ten days the 12 healthy subjects supplemented their diet with 0.3 g of either whole, crushed, or ground flaxseed for each kg of their body weight. The ten days were followed by an 11-day washout/period during which the subjects ate a lignan-poor diet.

The cross-over design of the study meant that the intervention was repeated three times.

The researchers measured *enterodiol* and *enterolactone* levels in the subjects' blood at the end of each supplement period and at the end of each wash out/run in period.

The mean bioavailability of *enterolignans* from whole flaxseeds was seen to be 28 percent that of ground flaxseed, and that of crushed flaxseed to ground was 43 percent.

"Crushing and milling of flaxseed substantially improve the bioavailability of the *enterolignans*," they wrote in the *Journal of Nutrition*.