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COVER STORY

Novel Method of Enhancing Anti-Fat Effects of CLA

The news on conjugated linoleic acid (CLA) keeps getting better! Published studies have documented the fat-reducing and anticancer effects of CLA. Now scientists have discovered a way to make CLA an even more potent anti-obesity agent.

Shedding excess body fat is a matter of life or death. Epidemiological reports reveal sharply increased risks for cardiovascular disease, Type II diabetes and certain cancers in those who fail to maintain normal weight.

This article reveals a novel method of helping to reverse age-related fat gain.

Excess body fat accumulates via two distinct mechanisms. People either form more adipocytes (fat cells), and/or existing adipocytes absorb too much fat-glucose and become larger. The effect of too many adipocytes and/or bloated adipocytes is the unsightly and unhealthy amassing of body fat.

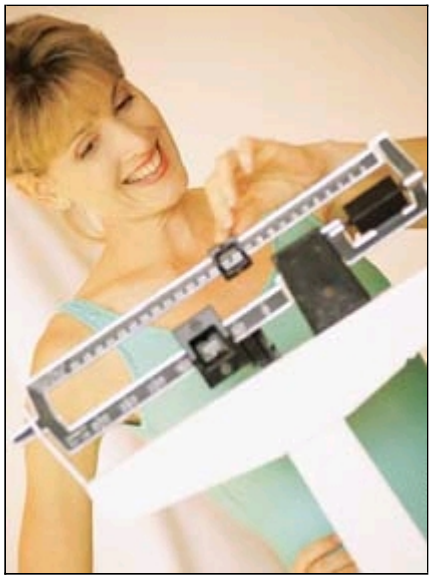
Conjugated linoleic acid (CLA) has been shown to decrease the volume of adipocytes and thus reduce body fat. However, many overweight people have too many adipocytes. These people need more than CLA to achieve effective weight control.

In a fascinating study just presented at a meeting entitled Experimental Biology 2002, scientists supplemented a group of mice with CLA or CLA plus guarana. After six weeks, both groups of mice showed a substantial reduction in fat mass. In the CLA-only group, the decreased fat mass was due to dramatic reduction in adipocyte size without a change in adipocyte number. In the CLA plus guarana group, both adipocyte size and number were reduced by 50%.[1]

The results of this study demonstrate that dietary CLA decreases excess fat accumulation by reducing the capacity of adipocytes to store fat. When guarana is added to CLA, there is an additional effect of reduction in adipocyte number, as well as a decrease in adipocyte size. The impact of this finding in preventing obesity is profound.

History of CLA

In July of 1996, The Life Extension Foundation introduced CLA to its members. Up until then, CLA simply was not available anywhere. At the time of launching, numerous published studies already detailed this nutrient's powerful anticancer effects.[2-5] What impressed scientists was that only relatively small amounts of CLA (3 to 4 grams per day) were required to achieve all of its wonderful effects.



In weight-loss studies, CLA consistently shows an ability to reduce body fat while maintaining lean muscle mass.

In an article published in the April 1999 edition of Life Extension magazine, it was pointed out that CLA improves insulin sensitivity, making it an agent that could possibly be used in the prevention and treatment of adult-onset diabetes.[6] By virtue of this same mechanism, CLA also becomes an effective anti-atherogenic and anti-obesity therapy. Other studies found that CLA lowers total and LDL cholesterol in rabbits with a subsequent reduction in the incidence of atherosclerosis.[7]

In weight-loss studies, CLA consistently shows an ability to reduce body fat while maintaining lean muscle mass. In one study, mice fed the human equivalent of 3000 mg to 4000 mg a day of CLA achieved a 60% reduction in body fat and a 14% increase of lean body mass.[8] Another study conducted at Louisiana State University showed up to an 88% reduction in the body fat of male mice fed CLA-after only six weeks![9]

A particularly significant study entitled "Dietary Conjugated Linoleic Acids Increase Lean Tissue and Decrease Fat Deposition in Growing Pigs" was published in the November 1999 issue of the Journal of Nutrition. The key element of the study was the confirmation that CLA is able to decrease fat storage and maintain lean muscle tissue. In this study, researchers used young female pigs to illustrate the effects of combining a relatively small amount of CLA with the pig's normal diet. Pigs have organs and metabolisms similar to humans, so they are good experimental models for human nutrition. Sixty pigs were randomly placed in one of six dietary treatments, one being the control group that received no CLA. Each other group received one of five different concentrations of CLA added to the animals' feed. The pigs had free access to water and their diet at all times (two kilograms of food per day).

After just four weeks of CLA supplementation, there was significantly less fat and more lean tissue in the groups receiving the CLA. After eight weeks, the pigs with the highest CLA supplementation showed a 31% loss of body fat and a 5% increase in lean tissue. In addition, at the highest level of CLA supplementation, the back fat depth was reduced by 25%. This study was the first to show the profound effects of CLA supplements on the composition and deposition of body fat, in relation to protein, water and other pig tissues.[10]

A study published in the August 2001 issue of the International Journal of Obesity and Related Metabolic Disorders concludes that conjugated linoleic acid (CLA) reduces abdominal fat among men classified as abdominally obese. The study participants taking CLA lost an average of 1.4 cm in waist circumference after only four weeks.

This double blind, randomized, placebo-controlled trial observed 25 men with significant abdominal fat for four weeks. Fourteen received 4.2 grams of CLA per day, while the others received placebo. At the conclusion of the study, there was a significant decrease of abdominal diameter among the CLA group. None of the study participants changed their eating or exercise habits during the trial period.[11]

Results of this study support data published in the December 2000 issue of the Journal of Nutrition. That study concluded that CLA reduced body fat and preserved muscle mass among the 60-person study group. Participants lost an average of six pounds while taking CLA.[12]

CLA is a unique supplement because not only does it guard against serious diseases, but it is also an effective tool for one of the most serious conditions affecting Americans-obesity. As more and more Americans join the ranks of the overweight, millions more start diets that are usually destined to failure.

Preventing cancer while losing weight

CLA is not just for fat-loss. Studies show it may help protect against many diseases including atherosclerosis and cancer.

In an article appearing in the December 1999 issue of Journal of Nutrition, significant cancer preventing properties were shown when CLA was added to the diet. This study revealed CLA to be a "potent cancer preventative agent in animal models." Specifically, it was determined that feeding CLA to female rats while they were young and still developing conferred life-long protection against breast cancer. This preventative action was achieved by adding only enough CLA to equal 0.8% of the animal's total diet. This compares favorably with Life Extension's recommendation of 3000 mg to 4000 mg daily, which is approximately 1% of the average human diet.[13]

In a study published in the July 1999 issue of Experimental Cell Research, CLA was shown to prevent mammary cancer if given before the onset of puberty. And even more important, if CLA was ingested during the time of the "promotion" phase of cancer development, the rats were conferred substantial protection from further developing breast cancer. Another significant finding was that CLA appeared to actually inhibit the growth of normal mammary epithelial cell organoids and induced apoptosis or cell death of those same cells. The researchers concluded that this led to a reduction in the density of the developing mammary glands in rats and therefore, the incidence of breast cancer was reduced.[14]

In the June 1999 issue of the journal Carcinogenesis, CLA was shown to reduce the size of breast tissue in rats and thereby reduce the incidence of carcinogenesis.[15] In a study published in the May-June 1998 issue of Anticancer Research, it was shown that CLA is also able to inhibit the growth of prostate cancer. CLA, as the article went on to say, can be considered a powerful prostate cancer preventative, as well as a partial treatment.[16]

CLA may work via a similar mechanism to anti-diabetic drugs such as Avandia and Actos to not only enhance insulin-sensitivity, but also protect against cancer. A report in the September 2000 issue of the journal Medical Hypotheses pointed out that a number of human cancer cell lines express the PPARgamma transcription factor, and agonists for PPARgamma can promote apoptosis in these cell lines and impede their clonal expansion both in vitro and in vivo. CLA can activate PPARgamma in rat adipocytes, possibly explaining CLA's antidiabetic effects in Zucker fatty rats. The report concluded by stating, "It is thus reasonable to suspect that a portion of CLA's broad spectrum anticarcinogenic activity is mediated by PPARgamma activation in susceptible tumors."[17]

(Note: The term "PPARgamma" is an acronym for "peroxisome proliferator activator-receptors-gamma." A PPAR gamma agonist such as Avandia, Actos or CLA activates the PPARgamma receptor. This class of drug is being investigated as a potential adjuvant therapy against certain types of cancer.) Another finding that provides insight into the biochemical action of CLA is its ability to suppress arachidonic acid. Since arachidonic acid can produce inflammatory compounds that can aid cancer proliferation, this may be yet another explanation for CLA's anticancer effects.[18-20] The suggested amount required to obtain the overall cancer-preventing effects is only 3000 mg to 4000 mg a day.

Clearly, we can expect more research and more interest in this fascinating supplement that has already proven itself to be a formidable foe to cancer, and able to promote weight loss with the development of lean tissue.

How CLA induces fat loss

In the May 2002 issue of the Journal of Nutrition, a study was done to ascertain the effects of CLA on calorie burning and fat storage in mice. CLA was shown to lower the amount of ingested food that was stored as body fat. CLA also increased the amount of fat excreted in the feces. The study found that CLA induced a reduction in body fat mass on mice fed either a calorie restricted or normal diet. The scientists defined the term "energy expenditure" as being the amount of food ingested minus the food retained on the body carcass and in the feces. CLA-fed mice showed a 74% increase in energy expenditure. The scientists thus concluded that the lower amount of ingested food stored on the body carcass was accounted for by this significant increase in energy expenditure.[21]

This new finding corroborates a study conducted at Louisiana State University where feeding male mice a CLA-enriched diet for six weeks resulted in 43% to 88% lower body fat, especially in regard to abdominal fat. This occurred even if the mice were fed a high-fat diet. The effect was due partly to reduced calorie intake by CLA-supplemented mice and partly to a shift in their metabolism, including a higher metabolic rate.[9]

In a study performed at the University of Wisconsin-Madison, mice supplemented with only .5% of CLA showed up to 60% lower body fat and up to 14% increased lean body mass compared to controls. The researchers discovered that CLA-fed animals showed greater activity of enzymes involved in the delivery of fatty acids to the muscle cells and the utilization of fat for energy, while the enzymes facilitating fat deposition were inhibited.[8]

A study using diabetic Zucker rats indicates that part of CLA's effectiveness in preventing obesity may lie in its ability to act as a potent insulin sensitizer, thus lowering insulin resistance and consequently insulin levels. Since elevated insulin is the chief pro-obesity agent, it is enormously important to keep insulin within the normal range. By activating certain enzymes and enhancing glucose transport into the cells, CLA acts to lower blood sugar levels and normalize insulin levels.[6]

CLA supplementation has been shown to improve the lean mass to body fat ratio, decreasing fat deposition, especially on the abdomen, and enhancing muscle growth. CLA enhances insulin sensitivity so that fatty acids and glucose can pass through muscle cell membranes and away from fat tissue. This results in an improved muscle to fat ratio.

CLA may also be antidiabetogenic, as it helps prevent insulin resistance. If the current animal study results are corroborated, CLA may prove to be important not only in the prevention of diabetes, but also as a new therapy for adult-onset diabetics, aimed at

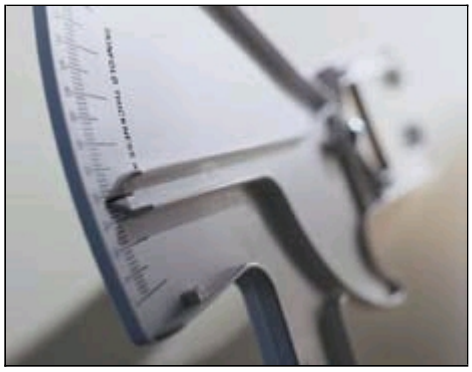
lowering insulin resistance. Findings presented at the 220th national meeting of the American Chemical Society (ACS), August 2000, suggest a role for the compound in both glucose control and weight loss.

Continued on Page 2 of 2

Back to the Magazine Forum

COVER STORY

How guarana induces fat loss



Guarana is an herb that contains a form of caffeine called guaranine, which is 2.5 times stronger than the caffeine found in coffee, tea and soft drinks. What makes guaranine unique from caffeine found in beverages is its slower release. That's because the guarana seed is fatty (even in powder form) and is not readily water-soluble. Therefore the body does not quickly absorb it.

Since the guaranine is released slowly, the energy boost that is experienced from guarana is not like that of coffee with its sudden rush and quick drop-off. Rather, it continues to escalate over hours.

While caffeine from beverages provides a short-lived energy burst that overheats and excites the body, guaranine has a cooling action that revitalizes and relaxes. This is because guarana contains other components that modify the activity of this substance. The end result is more beneficial to the body than tea or coffee.

Caffeine accelerates the effectiveness of CLA, thus making CLA a more potent fat burner. Guarana has been shown to stimulate the migration of lipids so fat can be burned as energy. It is also an appetite suppressant.

Guarana aids in a temporary, natural increase in body temperature and metabolic thermogenesis through nutritional stimulation of the body's ß receptor pathway, which can induce the breakdown and release of stored body fat, thereby allowing stored fats to be turned into energy.

Thermogenesis refers to the body's production of heat, a normal part of metabolic processes. Thermogenesis can be enhanced by certain nutritional substances. When stimulated through appropriate dietary supplementation, thermogenesis is also a mechanism that increases metabolic rate. Stored body fat, if released and available for use, can provide the fuel for this increased metabolic rate. Other active constituents of guarana are theobromine and theophylline, which are called xanthines (a class of thermogenic substances found in coffee, tea and certain beans). They have some effect on increasing metabolic rate, suppressing appetite and enhancing both physical and mental performance. They also act as muscle relaxants and possess diuretic properties.

Guarana increases mental alertness, fights fatigue, and increases stamina and physical endurance. Native to Brazil, guarana is taken daily as a health tonic by millions of Brazilians. It is reported to help overcome heat fatigue, detoxify the blood and is useful for flatulence and obesity. In body care products, it has been used for its tonifying and astringent properties, and in the treatment of cellulite.

In the United States, guarana holds a GRAS-status (Generally Regarded As Safe). In 1989 a patent was filed on a guarana seed extract that was capable of inhibiting platelet aggregation in mammals. The patent described guarana's ability to prevent the formation of blood clots and to help in the breakdown of clots that had already been formed. Clinical evidence was presented in conjunction with the patent in 1989 and again in 1991 by a Brazilian research group demonstrating these antiaggregation properties. Guarana has a long history of use as an energy tonic and for mental acuity enhancement.

Clinical studies on guarana

In a study published in the June 2001 issue of the Journal of Human Nutrition Diet, guarana extract induced weight loss over 45 days in overweight patients taking a mixed herbal preparation containing yerbe mate, guarana and damiana. Body weight reductions were 11.22 pounds in the guarana group compared to less than one pound in the placebo group after 45 days.[22]

Guarana extract and fractions decreased platelet aggregation up to 37% of control values and platelet thromboxane formation from arachidonic acid up to 78% of control values. When platelets hyperaggregate and/or when excess thromboxane formation occurs, an arterial blood clot can develop, resulting in a heart attack or ischemic stroke.[23]

In a 1997 study, guarana increased physical activity of rats, increased physical endurance under stress and increased memory, with single doses as well as with chronic doses. Interestingly enough, the study revealed that a whole guarana seed extract performed better and more effectively than did a comparable dosage of caffeine or ginseng extract.[24]

Another Brazilian research group has been studying guarana's apparent effect of increasing memory. Its antibacterial properties against E. coli and Salmonella have been documented as well.

A 1998 toxicology study with animals have shown that guarana is nontoxic at even high dosages of up to 2 grams per kilogram of body weight. This same study demonstrated guarana's antioxidant properties saying, "Guarana showed an antioxidant effect because, even at low concentrations (1.2 microg/ml), it inhibited the process of lipid peroxidation."[25]

A major advantage to taking guarana in an oil base capsule is its relatively slow release into the body. In a study published in the journal Pharmacology Biochemical Behavior, a comparison was made of the absorption of caffeine from coffee, cola or capsules. Based on saliva caffeine concentrations, the absorption from capsules was about 40% slower than that of coffee or colas. These capsules were not oil-based, yet the rate of caffeine absorption was still significantly slower than coffee or cola.[26]

Conclusion

The effect of CLA on blocking excess absorption of serum glucose and fatty acids into adipocytes (fat cells) is remarkable. CLA induces a reduction in the size of adipocytes. One reason people gain weight as they age is that their adipocytes literally become fatter.

Another cause of increased body fat storage is the proliferation of adipocytes. While CLA helps block the absorption of fat and sugar into adipocytes, it does not reduce the actual number of adipocytes present. Guarana has been shown to specifically reduce the number of adipocytes. When CLA was combined with guarana, there was a 50% reduction in adipocyte number.

While many published studies document the fat-reducing effects of CLA, the fact that CLA may protect against cancer, vascular disease and Type II diabetes makes it a preferred supplement for health conscious people to use daily.

In response to the study showing an added benefit when CLA is combined with guarana, a new supplement has been formulated that contains potencies of CLA and guarana that have demonstrated fat-losing effects in published studies.

Find out more about Super CLA with Guarana

See related article:
An analysis of whether cancer patients should take guarana

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Back to the Magazine Forum