

Weight Loss Supplements

An epidemic of obesity in both humans and companion animals has spawned a large trade in weight loss supplements. Some, such as those which contain ephedrine, have been eliminated from the market in the United States and Canada due to potential adverse cardiac effects. Some of the higher profile supplements remaining on the market include chitosan, pyruvate and linoleic acid.

Chitosan

Chitosan is a dietary supplement derived from the chitin shells of crustaceans. Chitin is of interest as a weight loss supplement because it chemically bonds to fat, ostensibly reducing its absorption from the gut into the body. While such an effect is plausible, it has proved difficult to demonstrate. In two studies, the amount of fat that chitosan caused to be excreted in the stool was too small to result in significant weight loss. In one study, no increase in stool fat excretion was observed at all. Chitosan failed to produce significant weight loss when used by itself to treat obesity in placebo-controlled studies. When used in tandem with other methods such as dietary restriction and education, however, chitosan significantly increased weight loss compared to placebo controls.



Another inconsistently demonstrated effect of chitosan is a reduction of serum cholesterol. Reductions in insulin resistance, serum triglycerides and blood glucose were observed in laboratory animals when a low molecular weight chitosan extract (chitosan lactate) was used.

Conjugated Linoleic Acid

Conjugated Linoleic Acid (CLA) supplements are a blend of linoleic acid isomers that appear to promote increased lipid oxidation or fat breakdown through as yet unknown mechanisms. Whereas chitosan is generally considered by researchers to be ineffective, results with linoleic acid supplementation are considered much more promising. Several studies have shown a reduction in abdominal fat mass following use of CLA, although in some randomized studies, the overall body mass index (an indicator of obesity) was not significantly changed. Japanese studies have demonstrated that CLA may increase overall metabolic rate, with the burning of fat occurring to simply generate body heat. One placebo controlled study of CLA in people showed that weight gains after dieting tended to be in lean body mass rather than fat. CLA also appears to have immune stimulating and anti-cancer effects. Products high in cis-9, trans-11 linoleic acid tend to be safer and have a better effect.

Pyruvate

Pyruvate, like CLA, is considered to have promising effects in promoting weight loss through as yet unknown mechanisms. Pyruvate is believed to increase the metabolic rate, particularly when administered in high doses. (Generation of ATP via catabolism of blood sugar and fat in the Krebs' cycle appears to be increased when pyruvate is present in high levels.)

Hydroxycitric Acid (HCA)

Hydroxycitric Acid, also called HCA, is a product extracted from the rind of the Tamarind, which is the fruit of the *Garcinia cambogia* tree. It suppresses hunger and helps prevent the body from turning carbohydrates into fat by inhibiting the ATP-citrate lysase enzyme. Placebo-controlled clinical studies of HCA in humans have shown a mild benefit in some cases and no benefit in others. HCA appears to be of more consistent effect when administered to animals.

How much experience is there with the use of weight loss supplements in pets?

Virtually no research has been conducted on the effects of these supplements in dogs and cats. It is reasonable to expect, however, that they would be similar to effects observed in humans and laboratory animals. Even clinical experience with these supplements is lacking, although chitosan has been used by some veterinary internists to chelate fat with the apparent benefit of reducing tendencies to pancreatitis. Clinical experience with pyruvate and CLA in obese dogs and cats is still lacking.

How safe are weight loss supplements?

Chitosan appears to be very safe for use in dogs and cats. Adverse effects in some humans receiving chitosan include mild nausea and constipation that resolves when the supplement is discontinued. Certainly chitosan should be avoided in all animals known to be allergic to shellfish. The small effect of chitosan on excretion of fat in the feces makes it extremely unlikely that it will contribute to malnutrition from loss of the fat-soluble vitamins (A, D, E).

Linoleic acid also appears to be safe for use in animals, with a reversible increase in fat metabolite deposition in the liver occurring only at very high doses. Certain isomers (trans-10, cis-12) of conjugated linoleic acid in CLA supplements may actually promote insulin resistance and the risk of diabetes, although the reasons for this are not yet clear. Fortunately, these isomers are present in much lower levels in CLA compared to the isomers with favorable effects.

Pyruvate and HCA appear to be non-toxic when used according to manufacturer's directions. It is important to note that no long-term studies on the adverse effects of chitosan, pyruvate and linoleic acid have been conducted.

Where do I obtain weight loss supplements and do I need a prescription?

Your veterinarian may have preferred supplements that he or she will recommend. Pet owners are cautioned against buying supplements without knowledge of the manufacturer, as supplements are not highly regulated and some supplements may not contain the labeled amount of ingredients. CLA supplements that are certified to be free of trans-10, cis-12 isomers are desirable, as are low molecular weight chitosan supplements. A prescription is not needed for chitosan, CLA, HCA or pyruvate.

This client information sheet is based on material written by Steve Marsden, DVM ND MSOM LAc DiplCH AHG, Shawn Messonnier, DVM and Cheryl Yuill, DVM, MSc, CVH.
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