are increasingly the front-line health professionals called upon to help overweight and obese people address their weight and lifestyle influences. As community pharmacists become increasingly engaged in assessing vascular risk, there will be even more opportunity to support patients at risk as a result of their weight in addition to other risks including smoking cessation. Enabling behavioural change in at risk groups will be a key skill for pharmacists and members of their team engaged in public health and well being services. ✣

Declarations of interest

The author has no interests to declare.

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Focus on OTC weight management products

Dietary products are widely available in national supermarkets, community pharmacies and health food stores. Knowledge of the more common ingredients and their effects may therefore help pharmacists to better inform patients and healthy clients. Some of the easily accessible products are listed in Table 1 along with their main 'active ingredients' and relevant manufacturer's notes.

There is some overlap in ingredients between products listed in Table 1, and in Table 2 some of the studies undertaken to deduce or confirm their effects are presented in brief. In general, there are even fewer rigorously conducted evaluations of non-prescription dietary products than there are of prescription obesity medicines and they often contain a cocktail of ingredients with limited proof of effectiveness or safety. How these ingredients interact individually and collectively with the body and/or with co-medication is often unstated and largely unknown. Marketing appears in some cases to rely on historical uses of individual ingredients without providing proof of efficacy or rationale for the doses used in the products. However, for some products data is beginning to be generated to shed light on the mechanism of action of some of the ingredients. The main effects of the products listed in Table 1 fall into the following categories:

Appetite suppressant effects, by swelling in the stomach, and producing gastric distension and/or activating vagal mechanoreceptors leading to hypothalamic inhibition of feeding behaviour (alginate, polyglucosamine, NeOpuntia®, possibly palm/oat oil emulsion) or by direct hypothalamic actions (possibly *Hoodia Gordonii*).

Lipid binding or adsorbing agents, which reduce the access of pancreatic lipase to consumed lipids and/or their breakdown into absorbable fatty acids (polyglucosamine, NeOpuntia®).

Delay gastric emptying (Yerba mate, damiana and guarana mixture, NeOpuntia®, possibly Boldo).

Laxative and/or diuretic actions (possibly butternut and Dandelion root).

Conclusions

The limited data available from manufacturers indicate that products, which act to increase satiation, such as Appesat™,[5] LIPObind™, Slimthru®[13–15] (possibly Bio-Synergy body perfect® and Formoline L112) and Zotrim®[18–21] can help people reduce their calorie intake. Products that reduce dietary fat absorption, such as LIPObind™,[10] and possibly Formoline L112 can help reduce the amount of fat absorbed and might therefore benefit those who continue to consume fatty foods despite being encouraged to follow a low-fat, high-fibre, balanced diet. Also, the findings of increased HDL-C and reduced LDL-C in older women taking NeOpuntia® with no additional hypolipaemic treatment,[29] if confirmed, might be important because HDL-C concentrations tend to fall in post-menopausal women.[30] Similarly, low blood HDL-C is an independent risk factor for the development of insulin resistance and metabolic syndrome, which is increasing in line with the rising level of obesity in the population. Clearly, further evaluation of the mechanisms of action, potential side-effects or interactions with medication for dietary product ingredients is warranted to add to the evidence base. ✣

Declarations of interest

none

Christine Knott, editor

Table 1. Some nationally available high-street diet products

Product and 'active' ingredients	Adult dosage	Manufacturer's claims/notes
Adios™:[1] Butternut 20mg, Dandelion Root 30mg, dry extract of Boldo 34mg and dry extract of Fucus 45mg	One tablet 3 times per day, usually at meal times[2]	Effective, natural herbal medicines, which help speed up weight loss by speeding up the metabolic rate and stimulating fat metabolism. Exceeding the dose may cause diarrhoea.[2]
Adios™ max:[1] Dry extract of Fucus 120mg	One tablet 3–4 times per day at meal times[3]	Stomach upset, cramps, nausea or bloating may occur. Adios™ products not recommended for people with thyroid disease, allergies to ingredients, age less than 16 years or in pregnancy.[3]
Appesat™:[4] CM3 Alginate extracted from the seaweed *Laminaria digitata*	Maximum daily dose is 9 capsules taken in three divided doses before main meals, but individualised dosing plans depend upon each person's appetite needs[4]	Taken before food, it works by stimulating mechanoreceptors in the stomach wall, which then send a signal to the brain informing it that the stomach is full.[4] Clinical studies show Appesat™ makes people feel fuller, longer.[5] Clinically proven to boost weight loss by more than 67% compared with dieting alone.[4]
Bio-Synergy Body Perfect®:[6] *Hoodia Gordonii* capsules	None stated[6]	*Hoodia Gordonii* contains a molecule that triggers a message in part of the brain to signal when the body is full[6] similar to the way glucose acts, but 10,000 times more active.[6] Clinical trials show that calorific intake can be reduced by up to 1000kcals/day.[6]
Bio-Syngergy CLA Slimming pill®:[6] Conjugated inoleic acid — an omega-6 fatty acid	One capsule 3 times per day with meals[6]	Can be used long or short term depending on goals.[6] Has anti-cancer properties and can help prevent heart disease.[6] Should lose body fat with regular use.[6] Works by reducing fat mass and increasing muscle mass — because muscle burns more calories than fat, it will help maintain a healthy weight.[6] CLA lowers total cholesterol levels while raising the 'good' cholesterol.[6]
Femmeherb Slim aid:[7] Fucus dry extract 45mg, Boldo dry extract 27mg, Butternut bark 10mg and Dandelion root 30mg	1–2 tablets 3 times daily[7]	Fucus (seaweed) is a mild thyroid stimulant so helping to increase the metabolic rate.[7] Boldo and Dandelion support liver function.[7] Butternut acts as a mild laxative helping to gently remove waste products from the body.[7] Side-effects are not known.[7]
Formoline L112:[8] Polyglucosamine, obtained from crustacean shells	For weight reduction 2 tablets twice per day with main meals and at least half a pint of water. To maintain a target weight, one tablet twice daily with main meals[9]	Formoline L112 is clinically proven to help lose or maintain weight when used in conjunction with a sensible diet and healthy lifestyle.[8] Polyglucosamine adsorbs fat, but is not digestible so is excreted along with a percentage of the fat consumed.[9] It also expands and produces a feeling of fullness.[9] Contraindications (C/Is) include taking steroids and fat-soluble vitamins.[9]
LIPObind™:[10] Dried Prickly pear cactus (*Opuntia ficus indica*) fibre — called NeOpuntia	Generally, if BMI <24.9 take 1–2 tablets after each meal or 2–3 after a high fat meal. If BMI 25–25.9 take 2–3 for weight loss (but 3–4 if after high-fat meal). If obese take 3 after a meal (3–4 if meal was high fat)[10]	LIPObind™ binds dietary fat creating a fat-fibre complex, which is not absorbed but is excreted naturally.[10] In clinical trials it removed up to 27% of undigested fat from a standard meal.[10] The fibre complex will expand to form a stable gel in the stomach. This creates a bulking effect, delays gastric emptying, extends the period of feeling full after a meal and helps reduce sweet food cravings.[10] C/Is: pregnancy, breast feeding, BMI < 18.5Kg/m^2.[10] Patient information leaflet states not to take steroids or fat-soluble vitamins within 2 hours of LIPObind™.
Slim shot:[11] Morning tablet: Extracts of green coffee, olive wood, ash wood, cola, mate, cynorhodon, wild pansy, cherry stalk, meadow-sweet, green tea; vitamins B1, B2, B3, B5, B6, B8, B9, B12, C, E Noon tablet: Apple and citrus pectins; guar gum; cider vinegar Night tablet: Extracts of pineapple, cocoa, orange skin, papaya, grape marc, chromium chloride	Effervescent tablets, one to be taken at morning (eliminates fats), noon (restricts fat absorption) and night (burns fats). They 'regulate the slimming chronobiology'[11]	The combined action of mate, green coffee, green tea and olive wood helps reduce surplus fat by increasing the body's energy expenditure.[11] Cherry-stalk, orthosyphon and wild-pansy extracts facilitate the draining and elimination of toxins.[11] Ash wood and meadow-sweet help reduce cellulite. Cola and vitamins help maintain the body's strength.[11] The combination of citrus pectins, apple pectins and guar gum effectively moderate the appetite thus helping restrict the absorption of sugars and fats.[11] Cider vinegar helps to restrict fat storage.[11] The combined action of chromium, which helps to moderate the appetite, and papaya helps to restrict fat storage.[11] The combination of cacao and orange peel stimulates thermogenesis, which helps to burn body fat.[11]
Slimthru®:[12] Palm oil, oat oil and water as an emulsion with a neutral smell and oaty taste. (The recommended daily intake of 2 x 7.5ml doses contains 4.2g of fat of which 1.96g is saturated fat)	7.5ml 'shots' — one at breakfast and one at lunch for full effect, but breakfast shot may be sufficient. To be consumed with or in food or alone[12]	Slmthru® appears to act on receptor proteins found in the small intestine to create a feeling of prolonged satiety. Small droplets stay in the gut for longer than other fats prolonging the feeling of satiety. It can reduce snacking, cut calorie intake by nearly one third[13–15] and reduce hunger sensation for up to 8 hours. In clinical trials, after weight loss, it (called Olibra) was shown to promote long-term weight maintenance.[16] No known side effects.[12] Not to be taken by pregnant women, under 18 years or people with BMI>30Kg/m^2.[12]
Zotrim®:[17] Yerba mate, Guarana and Damiana	2–3 tablets with glass of water or other cold drink before meals — to a maximum 9 tablets per day[17]	Zotrim® causes successful and sustained weight-loss[18–20] and reduced waist and hip measurements.[19,20] It works by helping users feel full faster during meals, feel less hungry between meals and be more active. This results in eating less during meals,[21] snacking less between meals,[21] consuming less calories but burning off more calories and successful weight control.[17]

Further information to support product claims was requested from all manufacturers, but to date (22 November 2008) only one (Goldshield) did so. Where published data were available, these have been included. For some products, however, the claimed 'clinical evidence' was not supported by published data.

Table 2. Common ingredients used in weight management products and experimental basis for their effect

Alginate from *Laminaria digitata*. A randomised double-blind study of 139 people with BMI 25–35Kg/m^2 given a low-fat, low-calorie diet for 12 weeks found that people who took 3 alginate-containing capsules with 3 main meals lost significantly more weight (9.4+/-3.1Kg; initial weight was 93.6+/-15Kg) than those who took placebo capsules (5.6+/-3.4Kg; initial weight was 86.8+/-9.5Kg). The frequency of self-reported feeling of satiation was higher in the alginate (77.1%) compared with the placebo (54.1%) group, suggesting they felt less hungry more often than the placebo group.[18]
Boldo — *Peumus boldus Molina*. At 2.5g dry extract prolonged oro-caceal transit time in 12 human subjects.[35] However, this dose is around 20–25 times greater than the amounts stated in the products in Table 2 and there is no conclusive evidence for these effects at the dosages used in the products listed in Table 2.
Butternut — *Juglans cinerea*. The inner bark contains naphthoquinones (among other constituents) which could have a similar laxative action to the anthraquinones found in rhubarb (*Rheum palmatum*) and senna (*Cassia angustifolia*). Data is lacking for such effects at dosages used in the products listed in Table 2.
Dandelion root — *Taraxacum officinalis*. There is no conclusive evidence to support effects seen at the doses used in the products surveyed.
Fucus (seaweed) contains high levels of iodine, but no clinical studies were identified that examined the effects of Fucus-containing products on thyroid status or metabolism to support manufacturer's claims. A plethora of effects of fucoidans extracted from Fucus have been reviewed recently, however.[36]
Hoodia Gordonii[37] extracts contain the p57 molecule — a pregnane glycoside.[38] When given intracerebroventricularly to rats p57 resulted in reduced food intake, possibly through normalising hypothalamic ATP levels.[39] Data is lacking to support efficacy as an appetite suppressant and the dosages used in the products in Table 2, however.
Conjugated linoleic acid (CLA). Animal studies show CLA consumption reduces body fat, but results in humans are less conclusive.[40]
NeOpuntia® — *Opuntia ficus indica* leaves. In an unpublished cross-over study, 10 healthy volunteers (5 women) with a BMI of 23.3 Kg/m^2 were randomly divided into two groups and given capsules of either NeOpuntia® (1.6g) or placebo at each meal for one week. The groups crossed over after a washout period. Meals were controlled to ensure a standardized intake of lipids. Intestinal absorption fat was evaluated by measuring steatorrhea in 3-day-old faeces at the end of the two test periods. The quantity of fat excreted compared with fat ingested was on average 27.4% higher in the NeOpuntia® group, suggesting an effectiveness within the framework of meals rich in fat content (unpublished data supplied by Goldshield). Following a study showing a reduction in low-density lipoprotein cholesterol (LDL-C) in NeOpuntia®-treated rodents[41] the first randomised, placebo-controlled, double-blind, 6-wk study of NeOpuntia® was completed by 59 women, aged 20–55 years with metabolic syndrome and BMI 25–40Kg/m^2.[42] All volunteers followed well balanced diets with controlled lipid input. NeOpuntia® (1.6g) or placebo capsules were taken at each meal. For 42 females aged 45 years or more taking NeOpuntia® a significant increase in high density lipoprotein (HDL-C) levels and a tendency toward decreased triglyceride (TG) levels was found. In women taking placebo a decrease in HDL-C levels was found. Forty-two females taking NeOpuntia® with no additional hypolipaemic treatment had a pronounced reduction in LDL-C, especially after day 14. At the study end 39% of the NeOpuntia® group and 8% of the placebo group were no longer diagnosed with metabolic syndrome.[42]
Palm oil/oat oil emulsion. No data were identified using individual oils, but studies carried out in three studies by the same researchers[26–28] a dose-related[26] reduction in energy and macronutrient intakes,[26–28] estimated by covert weighing of food serving dishes, was found in non-obese,[26–28] overweight[28] and obese[28] people for up to 36 hours[26] after consumption of the emulsion. Other researchers found emulsion consumption improved weight maintenance after weight loss compared to placebo.[29]
Polyglucosamine. Controversial findings from studies of the effect of polyglucosamines (PGs) in obesity are said to result from differences in the formulation used, doses and observation periods.[43] However, in one study of patients treated with PG, a significant reduction in body weight (from 82.0 Kg ±7.65 to 76.1 Kg ±7.89), total cholesterol (from 248.3 ±18.35 mg/dL to 214.0 ±15.16 mg/dL) and triglycerides (from 264.3±31.64 mg/dL to 224.6 ±29.85 mg/dL) were found.[43] Further controlled studies are needed to confirm and extend these findings.
Yerba mate — *Ilex paraguayensis* leaves. No studies where either Yerba mate (Y), **Damiana** (D; *Turnera diffusa var. aphrodisiaca* leaves) or **Guarana** (G; *Paullina cupana)* were taken alone were identified. However, when used in combination in healthy, overweight patients YDG delayed gastric emptying time (58 +/- 15 min compared to 38 +/- 7.6 min after placebo), reduced the time to perceived gastric fullness and was associated with weight loss (5.1 +/- 0.5 kg with YDG capsules compared to 0.3 +/- 0.08 kg with placebo after 45 days).[31] In subjects who continued to take YDG for 12 months in an uncontrolled study weight was maintained.[31]

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