

## Can Animals with Diabetes “Go All-Natural”?

Nearly half of human diabetic adults surveyed in the U.S. in 2002 used some form of (CAM).<sup>1</sup> These approaches included herbs, chiropractic, yoga, acupuncture, homeopathy, biofeedback, chelation, energy healing, Reiki therapy, massage, hypnosis, and more. A Canadian study indicated that people spent as much money on supplements as they did on prescription medications.<sup>2</sup> Thus, veterinarians managing patients with diabetes now have one more key component to include in their client education meeting. Specifically, veterinarians need to find out whether the animal is receiving any herbal mixtures, as these could conceivably alter blood glucose levels and offset insulin requirements.

At a seemingly unstoppable rate, herbals and nutraceuticals are growing in their numbers and claims; this includes products promoted for diabetics. It is no wonder, then, that clients are beginning to ask about non-drug insulin alternatives. The prospect of giving their animal once- or twice-daily injections can be overwhelming, either emotionally or from a time-management perspective. However, no “insulin-alternatives” deliver benefits proven to be as effective or reliable as insulin, and clients integrating these options should monitor their animal’s blood sugar levels closely.<sup>3</sup> Otherwise, uncertain outcomes could expose an animal to uncontrolled hyperglycemia. On the other hand, dangerously low blood glucose levels could result from additive effects. Further, the confidence that herbalists espouse based on “centuries of empirical evidence” cannot simply translate to veterinary practice. The same herbs advocated by herbalists for humans may undergo much different metabolic treatment by non-human physiologic processes.

It is easy, though imprudent, to underestimate the capacity of herbs to reduce blood sugar levels. In fact, hypoglycemic coma has been reported to occur in a child after ingesting bitter melon.<sup>4</sup> The accompanying table lists several botanicals commonly recommended for diabetics, although it represents merely a fraction of the growing gamut of products sought for sugar-lowering benefits. Some animals may be taking these substances for non-diabetic conditions; bilberry, for example, frequently appears in natural treatment regimens for ophthalmologic disorders.

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<sup>1</sup> Garrow D and Egede LE. Association between complementary and alternative use, preventive care practices, and use of conventional medical services among adults with diabetes. *Diabetes Care*. 2006;29(1):15-19.

<sup>2</sup> Ryan EA, Pick ME, and Marceau C. Use of alternative medicines in diabetes mellitus. *Diabetic Medicine*. 2001;18:242-245.

<sup>3</sup> Shapiro K and Gong WC. Natural products used for diabetes. *J American Pharmaceutical Association*. 2002;42(2):217-226.

<sup>4</sup> Facts and Comparisons: *The Review of Natural Products*. St. Louis, MO: Wolters Kluwer Health; 1999. Cited in: Shane-McWhorter L. Botanical dietary supplements and the treatment of diabetes: what is the evidence? *Current Diabetes Reports*. 2005;5:391-398.

The familiar risks of unapproved products stems from the lack of independent regulation, quality assurance, and manufacturing oversight. For example, in 2000, the California Department of Health Services issued a warning from the state health director that five Chinese herbal mixtures targeted for diabetics contained the undisclosed oral hypoglycemic agents glyburide and/or phenformin.<sup>5</sup> Crop-to-crop variations, the timing of harvests, and even changes in fertilizer usage can also alter the pharmacological makeup of botanical supplements. Selecting standardized medicinals diminishes this concern, though some herb enthusiasts argue that standardization offsets the plant's natural biochemical balance and thereby heightens the risk of toxicity.

Finally, as animals become increasingly regarded as family members, the ethics of denying proper treatment (i.e., substituting alternative treatments for insulin in an insulin-dependent diabetic) could come into question, as it has in human pediatrics. In 1992 in the U.K., the High Court found the parents of a 9 year old diabetic girl guilty of manslaughter after they refused insulin and instead sought treatment with homeopathy.<sup>6</sup> After six weeks of this misguided mismanagement, the girl lost one-third of her body weight. She arrived at the hospital in a diabetic coma and died four hours later.

Could a happy medium be reached? Certainly. Open communication between practitioner and client, full disclosure of known risks and the reality of unknown effects, and ongoing dialogue regarding the animal's health care status will serve practitioners well in optimizing the management of diabetic animals. Who knows – soon we may be seeing sugar-lowering ingredients appearing in all-natural, organic companion-animal diets, possibly disguised as spices, but designed to naturally regulate the diabetic animal consumer.

<b>Botanical Compound</b>	<b>General considerations<sup>7</sup> and specific indications</b>
<b>Aloe (<i>Aloe vera</i>)</b>	<input type="checkbox"/> Glucomannan in aloe gel may promote glucose uptake.
<b>Bilberry (<i>Vaccinium myrtillus</i>)</b>	<input type="checkbox"/> Unknown effects
<b>Bitter melon</b>	<input type="checkbox"/> Related to honeydew and cantaloupe melons.

<sup>5</sup> California Department of Health Services. State health director warns consumers about prescription drugs in herbal products [press release]. Sacramento, CA: Office of Public Affairs. Obtained at <http://www.fda.gov/oc/po/firmrecalls/Herbal.html>, on 03-19-06.

<sup>6</sup> Dyer O. Parents jailed after child dies of diabetes. *British Medical Journal*. 1993;307:1232-1233.

<sup>7</sup> Cicero AFG, Derosa G, and Gaddi A. What do herbalists suggest to diabetic patients in order to improve glycemic control? Evaluation of scientific evidence and potential risks. *Acta Diabetol*. 2004;41:91-98.

<p><b>(<i>Momordica charantia</i>)</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Contains polypeptide P, or plant insulin, which has a pharmacologic benefit similar to bovine insulin.</li> <li><input type="checkbox"/> May increase glucose utilization by the liver.</li> <li><input type="checkbox"/> Inhibits glucose absorption.</li> <li><input type="checkbox"/> Inhibits enzymes that participate in glucose production.</li> <li><input type="checkbox"/> Promotes glucose oxidation through the G6PDH pathway.</li> </ul>
<p><b>Cinnamon (<i>Cinnamomum cassia</i>)</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Improves blood glucose and lipid profiles. The active ingredient, hydroxychalcone, may increase insulin sensitivity.<sup>8</sup></li> </ul>
<p><b>Curcumin (from turmeric: <i>Curcuma longa</i>)</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Delayed the progression and maturation of streptozotocin-induced diabetic cataracts in rats in a dose-dependent manner.<sup>9</sup> It did so even in hyperglycemic rats.</li> </ul>
<p><b>Fenugreek seeds (<i>Trigonella foenum-graecum</i>)</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Also sequesters glucose in the bowel due to its high fiber content.</li> <li><input type="checkbox"/> May increase peripheral sensitivity to insulin.</li> <li><input type="checkbox"/> Increases the number of insulin receptors.</li> <li><input type="checkbox"/> Improves peripheral glucose utilization.</li> <li><input type="checkbox"/> Contains trigonelline, an alkaloid that lowers blood glucose.</li> <li><input type="checkbox"/> Contains 4-hydroxyisoleucine, which increases glucose-induced insulin release.</li> </ul>
<p><b>Garlic (<i>Allium sativum</i>)</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> May increase insulin secretion or promote the release of bound insulin.</li> <li><input type="checkbox"/> May reduce insulin degradation.</li> </ul>
<p><b>American Ginseng (<i>Panax quinquefolius</i>) or Asian ginseng (<i>Panax ginseng</i>)</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Possibly improves insulin sensitivity.</li> <li><input type="checkbox"/> May decrease carbohydrate absorption through the portal circulation.</li> <li><input type="checkbox"/> Increases glucose transport and uptake.</li> </ul>
<p><b>Gymnema (<i>Gymnema sylvestre</i>) – the “sugar destroyer”</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Most commonly suggested herbal treatment for diabetes mellitus.</li> <li><input type="checkbox"/> May block sugar absorption</li> <li><input type="checkbox"/> Appears to increase glucose uptake and utilization</li> <li><input type="checkbox"/> Possibly regenerates or revitalizes pancreatic beta</li> </ul>

<sup>8</sup> Shane-McWhorter L. Botanical dietary supplements and the treatment of diabetes: what is the evidence? *Current Diabetes Reports*. 2005;5:391-398.

<sup>9</sup> Suryanarayana P, Saraswat M, Mrudula T et al. Curcumin and turmeric delay streptozotocin-induced diabetic cataract in rats. *Invest Ophthalmol Vis Sci*. 2005;46:2092-2099.

	cells, enhancing endogenous insulin production in individuals with residual beta cell function. <input type="checkbox"/> Stimulates insulin release from beta cells by increasing membrane permeability.
<b>Nopal (<i>Opuntia streptacantha</i>)</b>	<input type="checkbox"/> Retards carbohydrate absorption due to its fiber and pectin content. <input type="checkbox"/> May increase insulin sensitivity.
<b>Psyllium (<i>Plantago psyllium</i>)</b>	<input type="checkbox"/> Increases viscosity of food in the gastrointestinal tract, slowing or reducing absorption of sugar. <sup>10</sup>

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<sup>10</sup> Shapiro K and Gong WC. Natural products used for diabetes. *J American Pharmaceutical Association*. 2002;42(2):217-226.