**KEY POINTS:**

- Soy is an excellent source of high quality protein.
- Soy isoflavones are plant-based antioxidants which have benefits for overweight and obese dogs.
- Soybean germ meal is a natural source of soy isoflavones.

The excellent nutrition delivered by soy is often overlooked when it comes to pet food diets. This “Nutrition Brief” will address this topic and discuss this ingredient’s many benefits. Nestlé Purina began research on the topic of soy isoflavones more than 5 years ago, and this newsletter will also present those positive findings.

**Soy: A High Quality Ingredient**

Soy is an excellent source of protein and carbohydrates. Whole soybeans contain 40% protein. And soybean germ meal, soybean meal, soy protein concentrate and soy protein isolate contain 42%, 48%, 65% and 90% protein, respectively.

Soy is also rich in polyunsaturated fatty acids, very low in saturated fats and contains no cholesterol. In addition, it contains calcium, iron, zinc, phosphate and magnesium.

**Soy as a Source of Highly Digestible Protein**

The soy proteins in most commercial pet foods have digestibility values comparable, or superior to, protein from animal sources.\(^1,2\) The apparent digestibility of protein from soy sources in diets of dogs has been variously reported as 71% to 90%, \(^3,4,5,6\) Three isocaloric, isonitrogenous dry dog foods with primary protein sources of either beef and bone meal, soybean meal, or a combination of these two ingredients showed no difference in protein digestibility.\(^1\) Other studies have shown that protein in soybean meal is at least as digestible as beef or poultry meals used in dog foods.\(^2,7\) Based on this data, the bioavailability of amino acids from soybean protein is comparable to that of protein from animal sources.

**Health Benefits of Soy**

Many health benefits have been associated with regular consumption of soy products in humans. For instance, soy has been found to reduce the risk of cardiovascular disease and certain types of cancer (breast and prostate cancer in humans); relieve a number of problems in post menopausal women including hot flashes, osteoporosis, and decline in cognitive function; reduce cholesterol and triglycerides in plasma; improve symptoms of hypertension, and prevent abdominal fat accumulation.\(^8,9,10\)

Soy has a long history of safe use in both humans and animals, including dogs and cats. On the following page, you’ll discover how soy isoflavones can produce benefits for the health and well-being of pets.
The Beneficial Role of Isoflavones

Isoflavones are natural plant-based nutrients which have beneficial antioxidant properties. Isoflavones can be found naturally in plant sources such as chickpeas and green tea, but they are highest in soy products. Soy isoflavones occur naturally in three different forms: daidzein, genistein, and glycitein. Soybean germ meal naturally contains high levels of daidzein and genistein, the isoflavones found to be beneficial in healthy weight management in dogs.11, 12 A research study using ovariectomized rats found that the isoflavones daidzein and glycitein prevented increases in body weight and abdominal fat accumulation.13

The level of isoflavones in soybean germ meal is approximately four times the level in soy meal.14, 15

Isoflavones and Obesity

Recognizing the safety of soy and the benefits observed in other species, Nestlé Purina began studying the benefits of soy isoflavones in dogs more than 5 years ago, using randomized, controlled studies.11, 12, 15 Compared to the control diet, the isoflavone-containing diet was found to:

• Slow body fat accumulation and weight gain in overfed dogs.12
• Help reduce oxidative stress in overweight dogs, which may help reduce the risk of arthritis and diabetes.15
• Improve insulin clearance (the Purina Life Span Study showed that chronic high blood insulin was associated with certain chronic health problems, such as diabetes).15
• Increase energy metabolism (energy expenditure) in neutered male dogs.15

Comparison of isoflavone content in soybean meal and soybean germ meal

<table>
<thead>
<tr>
<th>ISOFLAVONE</th>
<th>SOYBEAN MEAL</th>
<th>SOYBEAN GERM MEAL</th>
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<tbody>
<tr>
<td>DAIDZEIN</td>
<td>32%</td>
<td>52%</td>
</tr>
<tr>
<td>GENISTEIN</td>
<td>66%</td>
<td>17%</td>
</tr>
<tr>
<td>GLYCITEIN</td>
<td>3%</td>
<td>31%</td>
</tr>
<tr>
<td>TOTAL ISOFLAVONES</td>
<td>1490 mg/kg</td>
<td>6260 mg/kg</td>
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The safety of soy isoflavones was evaluated during long-term testing and no clinical evidence of adverse effects were observed, and the isoflavone-containing diet had no adverse effects on thyroid function, blood chemistry, or complete blood counts.

References