Nutritional Alternatives for Cancer Patients

Basics of Cancer Nutrition

With the exception of canine lymphoma and some nasal and oral tumors, there is no scientifically proven dietary recommendation for cancer patients. Veterinarians and pet owners interested in alternatives or complements to conventional practice often shun commercial diets, and some cancer patients refuse them, as well. We have used a variety of home-prepared and commercial diets for our cancer patients. Based on Ogilvie's work using low carbohydrate, moderate fat and moderate protein diets for lymphoma patients (Ogilvie, 1998), we have used homemade diets that reduce carbohydrates while providing quality protein, presumably appropriate fat and fatty acid profiles, and high levels of nutrient rich vegetables.

Rule number one is to KEEP THEM EATING, so we don't stand on principle if our patients dislike our cooking,or the commercial food we choose for them. On the other hand, the majority of canine and feline patients appear to improve in general condition after becoming acclimated to the diet below, and we assume that their general improvement bodes well for the course of their disease, at least to optimize survival times and quality of life.

Cancer patients often have increased lactic acid levels in the blood (Ogilvie 1997), which can lower the blood pH and cause muscle soreness and poor energy. Since simple carbohydrates in the diet contribute to lactic acid production, then a diet with reduced carbohydrates is preferred. Also, tumors preferentially use carbohydrates rather than proteins and fats as nutrition for growth. So by feeding more proteins and fats and fewer carbohydrates, we can attempt to starve the tumor, while feeding the cat or dog. Additionally, dogs with cancer have increased protein requirements due to protein wasting (Mazzaferro 2001).

Research has shown a pronounced decrease in certain amino acids such as arginine in the blood of cancer patients. Supplementation of the arginine and other amino acids (more protein) may improve immune function and otherwise positively affect cancer patients. Arginine decreases tumor growth and spread, and another amino acid glutamine may slow weight and muscle loss seen in cancer patients, and may protect the intestines from the negative affects of some chemotherapy drugs. However, some studies have shown no benefits and occasionally increased vomiting and diarrhea in pets supplemented with glutamine. At this time, there is no clear-cut recommendation for or against supplementing glutamine in cancer patients.

Home Cooking

Home made anticancer diets should contain the following nutrient levels. Percentages are by percentage of calories provided, not percentage by weight. The recipe below conforms to these standards.

Dogs: 35-45% protein, 30-35% fat, and 20% carbohydrates.

Cats: 50-60% protein, 35-40% fat, 0-15% carbohydrates. Cats can have more protein and fat, and minimal or no carbohydrates. Unlike dogs, they are true carnivores and have no real carbohydrate requirements. As well, they tolerate high fat diets very well (dogs can develop gastrointestinal upset or even pancreatitis when fed too much fat).

When choosing protein, fish or poultry are often best. I prefer organic, but organic meat can be expensive and hard to come by, and there is no real evidence that cancer patients do better on organic foods compared to other fresh foods. I admit that my preference for organic is a personal bias. When choosing vegetables, those with less starch and sugar are more desirable, and those with more color (red, green, yellow) often are more nutrient and antioxidant rich. Broccoli, cabbage, kale, green beans, turnip and collard greens, peas, carrots, squash and many more vegetables are acceptable. Use corn, potatoes, and other starchy vegetables in moderation. Sweet potatoes and new potatoes are much preferred to white potatoes, and remember to leave the skins on, as there are extra nutrients in the skins.

Dr. Susan Wynn's Cancer Diet:

- 50% by volume fish or poultry (75% for cats)
- 50% by volume mixed frozen or fresh vegetables (25% for cats)
- Olive oil as a source of fat calories - about 1 tsp per 20lbs of body weight
- A vitamin-mineral supplement according to label directions if a veterinary product (if using human multi-vitamins, 1 dose for pets over 20 pounds, and ½ dose for pets less than 20 pounds)
- A calcium source (Tums work well) - about 250mg per 15 pounds of body weight

Many people use a crock pot to stew all ingredients together. Some prefer to steam the vegetables, add the cooked meat, and throw everything into a food mill so that it looks like commercial canned food. Raw meat is never recommended for animals undergoing chemotherapy or who are immunosuppressed in any way. This recipe is NOT perfectly balanced as is - the patient and the recipe should be re-evaluated frequently in order to adjust the recipe according to the animal's weight, disease progression, and other changes in condition. To have a diet balanced especially for your pet, please visit http://www.petdiets.com.

There are a number of spices shown to have anti-cancer activity that will also improve the flavor of this recipe. Garlic may induce differentiation and apoptosis in some tumor cell lines (Li, 1998), (Thatte, 2000). See explanation below of these two terms. Turmeric, the yellow (and rather mild) spice that gives curry its yellow color, has recognized cancer preventive activity, but of importance for cancer patients, turmeric is antioxidant and induces liver detoxification enzymes (Piper, 1998) . Try FRESH minced garlic (add just before serving) - about 1 clove per 40 lbs of body weight, and turmeric, about 1 tsp per 50lbs of body weight. Be careful not to give too much garlic to cats – high doses can cause anemic toxicity.

Commercial Diets

There is a commercial diet on the market for dogs, made by Hill's Science Diet, called "n/d" or "neoplastic diet," which has restricted carbohydrates, increased arginine, and increased protein and fat, and increased omega-3 fatty acids from fish oil. In controlled studies, dogs with lymphoma that were being treated with chemotherapy and being fed n/d had increased survival times, when compared with dogs being treated with the same chemotherapy protocol and being on a standard commercial diet. There were similar findings for dogs with nasal and oral cancer and undergoing radiation therapy. Survival time increased, remission periods were longer, and quality of life improved due to decreased pain from radiation therapy. While these results are impressive, we can't be sure that other cancers will be helped in the same way by feeding n/d or a similar home made diet.

The drawbacks of the n/d diet are that it is rather expensive (especially for large breed dogs), it is available only in a canned form (likely due to the high fat content) and the protein source is an animal by-product from beef lung, which might be objectionable to those who prefer natural foods. Also, some dogs just don't seem to find it very palatable. We recommend buying a fe cans to see how your dog likes it, before buying a whole case.

There is no diet on the market specifically made for cancer in cats, but there are plenty of cat diets with high protein and low carbohydrates, to which other supplements can be added. There is only one dry diet on the market with less than 10% carbohydrates: EVO by Innova, a manufacturer of natural cat foods. A close second is Purina DM, which is 15% carbohydrates. Purina DM is relatively high in protein and relatively low in carbohydrates, but is not a whole food, natural cat food as EVO is. There are many high protein, low carbohydrate canned diets for cats on the market (see attached handout).

Nutritional Supplements : Antioxidants and Fish Oil

Certain nutrients (vitamins, minerals, herbals, etc.) function in the body to reduce oxidation, a chemical process in the body which can cause injury to the tissues. Cancer can increase oxidation, and after it occurs, by-products such as peroxides and "free radicals" accumulate in the body and can damage tissues and cause cells to function poorly. Anti-oxidants can help remove these potentially damaging by-products, and may specifically help cancer by slowing proliferation of neoplastic cells and reducing adverse effects of chemotherapy. While many believe that antioxidants interfere with chemotherapy, others suggest that they actually enhance the effects of chemotherapy (Conklin, 2000). Antioxidants such as Vitamin A, C, E, selenium, zinc, CoQ10, the antioxidant enzymes and many other ingredients in herbals are mutually dependant on each other for their generation and activity. For this reason, antioxidants should be provided as a broad spectrum, rather than singly. The beneficial effects of fish oil (see below) may also be suppressed by high levels of antioxidants, so I usually recommend low to moderate doses of a combination product, such as Cell Advance by VetriScience. It is readily available at our clinic and on the Internet.

The omega-3 fatty acids EPA (eicosapentanoic acid) and DHA (docosahexaenoic acid) are derived from fish oils of coldwater fish, such as salmon, trout or menhaden, and the omega-3 fatty acid ALA (alpha-linoleic acid) is derived from flaxseed oil. The omega-6 fatty acids LA (linoleic acid) and GLA (gamma-linoleic acid) are derived from the oils of seeds of evening primrose, borage, black currant, and flaxseed. In vitro ("test tube") studies have shown that Omega-3 fatty acids slow tumor growth, while omega-6 fatty acids can speed tumor growth. While flaxseed oil is a popular source of omega-3 fatty acids, we do not recommend it for cancer patients--we think fish oil is better. Flaxseed oil contains ALA, which must be converted to EPA and DHA to do its job in cancer patients. Dogs and cats do not make this conversion well. Also, flaxseed oil contains omega-6 fatty acids, which are not recommended for cancer patients.

Fish oil appears to have antiproliferative activity in some tumor cell lines, antimetastatic activity in laboratory animals, prevents weight and muscle loss in human patients, and reduces radiation damage to the skin (Rose, 1999), (Sauer, 2000). It is frequently recommended for canine and feline cancer patients at a rate of 1 regular strength capsule (250-300mg of DHA and EPA) per 10 lbs of body weight per day, or one extra strength capsule (500-600 mg) per 20 pounds body weight . Some recommend much higher doses which are similar to the levels in n/d (up to 1 capsule per pound body weight per day) when you are not using fish as the protein source in the diet.

Herbal Anti-Cancer Remedies

Many chemotherapy drugs currently in use in medicine were first identified in plants and nature, including L-asaparaginase (an enzyme), taxol, vinblastine, vincristine, etoposide, teniposide, etc. As well there is anecdotal evidence from holistic practitioners that herbs offer improved quality of life and may support remission in some cases. Few holistic veterinarians would claim cure though.

Plant derived **flavonoids** have been studied in the prevention of cancer. The include resveratrol from red grapes (and wine), green tea polyphenols, and phytoestrogens from soy and other plants. Other less well-known flavonoids commonly found in medicinal herbs include curcumin (from turmeric), apigenin, anthocyanadins (from berries), quercetin, and many others (approximately 4,000 flavonoids have been described so far). Flavonoids have the following anti-cancer effects (Boik, 2002), (Lopez-Lazaro, 2002):

- antioxidant effects that may help in prevention of cancer
- induction of differentiation (cancer cells are undifferentiated, or like embryonic cells which don't know yet what they are going to be when they grow up)
- induction of programmed cell death of cancer cells, called apoptosis
- inhibition of angiogenesis (formation of blood vessels to feed the tumors)
- inhibition of cancer cell invasion and metastasis mechanisms (metastasis is when cancer spreads to many parts of the body)
- enhance immune function

There are other herbs and food supplements which have particular effects for particular types of cancer, and might also be recommended, based on your dog or cat's specific diagnosis. May are supported by some evidence, and many more have absolutely no merit at all. Some of the more common herbs used for cancers are listed below. If you have questions about one which does not appear on the list below, please ask.

- **Antiangiogenics**: Compounds that slow formation of blood vessels which nourish tumors (such as **shark cartilage** and the antibiotic **doxycycline**) have been used to treat fast growing solid tumors, with mixed results. Shark cartilage (Cartilade is a good brand) may be more effective when given by retention enema than when given by mouth. The "Navy Protocol" that you may have heard of is based on this mechanism of treatment. Garlic may have some antiangiogenic properties.
- **Artemisinin**: is currently being evaluated for treatment of osteosarcoma in dogs. The jury is still out on this one, and it can be quite expensive for larger dogs. It is a compound extracted from sweet wormwood, also known as the Chinese herbal Qinghao. There have been two anecdotal reports, one in a dog with metastatic osteosarcoma and one in a dog with metastatic anal sac carcinoma. Both showed temporary reduction in tumor burden and improved quality of life.
- **Boswelia**: There are 2 case series in the literature that suggest Boswellia slows the course of complications in brain tumor cases.
- **Cansema**: is a cancer salve that kills tumors cells preferentially, and can "burn" a tumor off without surgery. This can be painful and irritating, and is not usually recommended for pets. Also, it can be toxic if ingested. There is one case of a tumor in a dog's mouth which was treated with this salve under sedation for 30-60 minutes, several times, with good success reported by the veterinarian who used it.
- **Hoxsey Formula** and **Essiac Tea** are herbal blends that have been used traditionally for cancer. There is little scientific evidence to either prove or disprove their efficacy, though I think they have been used enough that we know they are probably safe for dogs and cats. If you are interested in more information about Essiac, there is a book about it entitled, "Calling of an Angel," by Gary Glum.
- **Mistletoe**: results of studies are inconsistent, and this herb is potentially toxic, and should be used with caution.
- **PolyVMA**: this is a VERY EXPENSIVE supplement, with powerful testimonials on the manufacturer's website, but absolutely no evidence to support that it works as the manufacturer claims.
- **Vitamins A and D** have been used in high doses by holistic vets for bone tumors.

Herbs that Stimulate the Immune System

We don't really know whether things that stimulate the immune system actually help fight cancer, but because in theory they might or should, many use immunostimulants for cancer patients. Some of the more commonly used immunostimulants are listed below. Keep in mind that we need to be VERY careful about using things that stimulate the immune system in pets

with lymphoma, since it IS a cancer OF the immune system, and could potentially be WORSENED by stimulating the immune system.

- **Aloe vera**: Acemannan and other mannans have been shown to stimulate immune cells, and have been recommended by some for treatment of sarcomas. Ambrotose made by Mannatech is a product that contains mannans from aloe vera, referred to as "glyconutrients" by the manufacturer.
- **Astragalus**: an herb used traditionally to stimulate the immune system, likely safe in dogs and cats.
- **Beta glucans**: natural carbohydrates which have been shown to have general immunostimulatory properties in animal studies and in vitro analyses (test tube studies). Among effects are macrophage (immune cell) activation, tumor inhibition and decreased infection rates.
- **Cat's Claw**: herb used traditionally for its immunostimulant and anti-inflammatory properties.
- **Corydalis**: is a Chinese Herb used in Traditional Chinese Medicine remedies for pain. It can be used to control pain in tumors that are painful, such as bone cancer.
- **Echinacea**: this herb has been traditionally used to stimulate the immune system, but there is no evidence that it has any effect on cancer.
- **IP6**: Inositol hexaphosphate (IP6) is a naturally occurring compound that has been shown to suppress the growth of carcinomas, including those of breast, colon and skin.
- **Mushrooms (ganoderma, reiishi, maiitake, shiitake)**: have been used for thousands of years in Traditional Chinese (Herbal) Medicine for immune stimulation.
- **Pau d'arco**: used traditionally for its anti-cancer and immunostimulatory properties. High doses can cause gastrointestinal upset.
- **Transfer Factors**: are small proteins from blood, colostrum of all animals and eggs of birds that stimulate immune cells. The proteins are exactly the same in every animal they have been found in, so can be taken from one species and given to another. There are many products with transfer factors on the market, including colostrum, colostrum extracts, hyperimmune egg products, etc. **Transfer Factor Plus Canine Complete** is a commercially available product which contains transfer factor, as well as a broad spectrum herbal immunostimulatory blend, and a general multi-vitamin-mineral formula. There is scientific evidence that all of the ingredients in Canine Complete actually do stimulate the immune system, and there was a recent clinical trial using transfer factor plus in people with end stage cancer that showed significantly increased survival time (See et al, 2002). **Transfer Factor Feline Complete** does not contain the herbal blend, as sometimes it causes stomach upset in cats.
- **Turmeric**: has shown some benefit in human stomach cancers

Ionized, alkaline water

Alkaline, ionized water (created by a water generator device) has powerful antioxidant properties. As well, the water is microclustered for energetic healing properties, and pH controlled. More information can be provided upon request.

Summary

Few of the nutritional therapies discussed above have been scientifically proven to increase length of life or quality of life on a consistent basis in canine or feline cancer patients. This author uses them, however, based on clinical success in the past. If cancer patients feel good enough to tolerate the diet change and supplements, this regimen of low carbohydrate homemade diet with therapeutic spices, antioxidants, fish oil and flavonoids can improve and maintain good physical condition in a number of patients.

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