# Herbal Supplements – Buyer Beware

**Jack W. Dini**
1537 Desoto Way
Livermore, CA 94550
E-mail: jdini@comcast.net

My brother-in-law is a proponent of melatonin for promoting sleep and fighting jet lag on long distance airplane flights. So I tried some. It did nothing for me. Zip. Nada. Then I read that researchers at the University of Maryland showed that melatonin tablets don't always release their contents in a timely fashion. Although industry standards for the breakdown of conventional drugs is generally 30 minutes or less, the studies showed that some commercial melatonin supplements didn't disintegrate or release their contents for periods of 4 hours to more than 20 hours, by which time an ingested tablet may have been excreted. I'll bet my melatonin was one of these brands.[1]

Turns out this isn't so unusual for herbal and dietary supplements. Many of these products aren't what is advertised on the label.

An estimated 20,000 herbal products can be found on the shelves of supermarkets, convenience stores, pharmacies and health food stores, and at websites.[2] The popularity of these products has soared. In 2001 alone, Americans spent $4.3 billion on herbs and other botanical remedies. Yet, these products, unlike prescription and over-the-counter drugs, remain unregulated. As Jane Brody reports, "Herbal remedies don't have to meet the standards of safety and purity specified in the Federal Food, Drug and Cosmetic Act. The same applies to vitamins and minerals sold as dietary supplements. And, none of them have to be tested to define their medicinal effects."[3]

Two major problems exist with herbal supplements: proper labeling of ingredients and lack of supporting scientific studies.

Here are some labeling issues:

• **Ginseng**: Swedish researchers examined 50 ginseng products sold in 11 countries and found that six samples contained no active ingredient and the concentration of ginsenosides in the other samples ranged from 2 to 9%. One sample, sold in the United States, contained no ginseng derivatives at all but had undeclared ephedrine, a potentially dangerous stimulant.[4] Other researchers reported that the amount of the active ginseng ingredient in each pill varied by as much as a factor of ten among brands that were labeled as containing the same amount. And again, some brands contained none at all.[5,6]

• **Echinacea** sales represent 10% of the dietary supplement market in the United States, but there is no guarantee as to the content, quality, variability or contamination in Echinacea preparations. Christine M. Gilroy and her colleagues at the University of Colorado Health Sciences Center in Denver evaluated 59 commercial echinacea products from local stores. They report that none offered consumers what had been promised by its label. Six contained no evidence of any echinacea, and 28 failed to contain the specific species that was listed on the box. Some offered echinacea in quantities exceeding, or, more often, falling below the quantity on the label, sometimes substantially.[1]

• **Glucosamine/chondroitin**: Have you tried this for your arthritis? I did, but it didn't work for me. Perhaps, like with melatonin, I ran into the following problem. One testing laboratory reported that half of the glucosamine/chondroitin products it sampled did not contain as much chondroitin as was listed on the label, perhaps because this substance costs four times as much as glucosamine. The testing laboratory also found supplements of saw palmetto, ginkgo biloba and echinacea to contain less of those substances than listed on the product labels.[7]

• **Ginkgo**: Another popular herbal product, this was consumed by 14% of Americans during 2002 to "enhance memory," as the label says, even though empirical studies have never found any "measurable benefit in memory or related cognitive function to healthy adults."[8] From one-third to one-half of products labeled as echinacea, ginkgo biloba, ginseng and St. John's wort failed analytical tests conducted by ConsumerLab.com because they had far too much or too little of the advertised active ingredients or were contaminated with an unrelated hazardous agent.[9] As Lee Silver notes, "Any other consumer product with a similar level of variability in claimed ingredients would have been yanked off the market immediately."[10]

• **Ephedra**: Twenty over-the-counter ephedra products ingredients often didn't match label claims.[1] When researchers tested several batches of a brand, some differed in concentration by up to tenfold. Only 13 of the 20 products listed quantities of the raw source plant. In many cases, Bill Gurley of the University of Arkansas says those values bore no relation to what was present. His group published its findings in 2000. Since then, the researchers' testing of 130 additional ephedra products found far fewer discrepancies between the labels and contents, "although they do still occur," says Gurley.[1]

• **St. John's wort**, a possible antidepressant, showed a wide range of concentrations of the purported active ingredient, which is called hyperforin. Batch-to-batch hyperforin differences in one supplement brand varied 15-fold.[1]

By now you probably get the point. With no truth-in-labeling law, consumers are playing a form of roulette with herbal supplements. Besides this, no government agency has approved or evaluated the contents, let alone determined that they will work.

Marion Nestle notes, "In contrast to the protection afforded European consum-

ers, Americans get little or no help from government in evaluating dietary supplements. The present anarchy in the dietary supplement marketplace is the result of decades of political action by the makers of these products, culminating in the industry's crowning achievement - the Dietary Supplement Health and Education Act of 1994, an act invariably referred to as DSHEA (pronounced "D'Shay"). DSHEA gave the industry everything it wanted and then some; it deregulated dietary supplements and undermined the FDA's regulatory authority over supplements and conventional foods as well. After DSHEA, the FDA could no longer take the kind of responsibility for ensuring the accuracy of information on product labels that consumers had come to expect."[11]

## Other problems

Janet Raloff adds, "Quality control problems in herbal supplements often start with the hundreds of chemicals that plants contain. The type and quantity of these compounds vary in response to the environment in which a plant grew, its soil type and nutrition, water availability, excessive heat or cold, exposure to toxic minerals, degree of shading and any hybridization."[1]

With many of these supplements there are several species of the product. For instance, there are several species of ginseng, one native to Asia, another to North America and one to Siberia. The chemical composition of these species is quite different. In fact, there can be significant variation between two plants from the same family grown under different climactic conditions.[1]

Raloff reports on B.S. Patil and his colleagues at Texas A&M University in Weslaco, who studied horticulturally or triggered variation in several citrus compounds that are regarded as potential nutraceuticals, because they've inhibited cancers in laboratory animals. Results showed that concentrations of one such chemical - limonim glycoside - peaked midway through the crops' harvest season. So, when it comes to this agent, Patil says "You must eat two grapefruit in May to get what one picked around Christmas will give you."[1]

Patil has also been quantifying lycopene, a potential anticancer carotenoid that turns plants red. When his group planted Florida derived rootstock of Star Ruby grapefruit in Texas, the fruit produced some 50% more of this carotenoid than it had in Florida.[1]

## Strange viewpoint from activists

The European Union and many environmental groups advocate application of the precautionary principle (PP) to genetically-modified (GM) foods. But strangely, environmentalists do not apply the PP to organic food or natural dietary supplements, which unlike GM foods are responsible for many documented cases of illness and death. Alan McHughen asks, "Does it strike you odd that the same groups that decry and demand more stringent regulations of GM products are often the same ones who decry and demand less regulation of 'natural foods' and 'herbal remedies'? Surely, if there were a health and safety concern, the source of the problem, whether GM or 'natural' shouldn't matter; it should be investigated and regulated."[12]

## Summary

Herbal remedies don't have to meet the standards of safety and purity specified in the Federal Food, Drug and Cosmetic Act. The same applies to vitamins and minerals sold as dietary supplements. And, none of them have to be tested to define their medicinal effects.

As Jane Brody reports, "This is not to say that all these remedies are unsafe, impure or ineffective. Some are made by reputable companies under near-pharmaceutical conditions. Some have been tested in well-designed clinical trials. Still, the consumer has no way to know exactly what is in the bottle and what effects the contents may have on health."[3] *P&SF*

## References


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## Test Your Plating I.Q. #433

*By Dr. James H. Lindsay*

***Un Peu de Tout* (A Little Bit of Everything)**

1. Metalworking fluids used on parts to be plated should **never** contain _____ as foam suppressants.
2. Faraday's Law states that _____ coulombs (one Faraday) will deposit the _____ equivalent weight of a metal.
3. (*True or false*) Magnetic gages are used for the non-destructive measurements of the thickness of magnetic deposits on steel.
4. Theoretically, the thickness of an anodized coating should increase linearly with time, but it doesn't work out that way. Why?
5. Substances possessing both acidic and basic properties, depending on their surroundings, are said to be _____.

*Answers on page 29.*