Your Independent Distributor is:

Nature's Sunshine Products, Inc.
Spanish Fork, Utah 84660

Stock No. 2305-9

110010BD

www.naturessunshine.com

Nature's Sunshine Products

Quality Assurance

The Herb Specialists

Quality Assurance
Nature's Sunshine Products

Read through this booklet to learn why Nature's Sunshine is the quality leader in the natural supplement industry. Then have the information on hand when you share the *Lifestyle Analysis* with friends and neighbors. Someone is bound to ask you, "Aren't all herbs pretty much the same?" or "Why should I buy from Nature's Sunshine when Big-Mart sells them cheaper." With the information in this booklet, you'll be able to explain why all supplements are not created equal and why it's so important to buy from a name you can trust…Nature's Sunshine.

Someone is bound to ask you, "Aren't all herbs pretty much the same?"

In a world that's becoming increasingly hostile to human health, there has never been a greater demand for products that take a natural, holistic approach to wellness—an approach designed around the interdependence of the body's various systems.

Nature's Sunshine Products perfectly meets this growing worldwide need by marrying time-honored wisdom with cutting-edge technology. By placing in your hands the finest-quality herbs and nutritional supplements, Nature's Sunshine gives you the tools you need to take charge of your health and to look and feel your best.

Quality begins in the fields, where only the finest herbs and raw materials are selected. The company's global sourcing of raw materials ensures that the highest quality products are chosen from each harvest season.

At Nature's Sunshine, uncompromising quality is not an option—it's an obligation. It's not a vague goal—it's standard operating procedure. That's why Nature's Sunshine is the acknowledged quality leader in the industry.

Quality begins in the fields, where only the finest herbs and raw materials are selected. The company's global sourcing of raw materials ensures that the highest quality products are chosen from each harvest season.

After being harvested, these materials are shipped to the Nature's Sunshine manufacturing facility, where they are subjected to a series of in-depth quality control tests to ensure purity, potency and cleanliness. All incoming raw materials are thoroughly tested before they are released for use in Nature's Sunshine supplements. Quality checks continue throughout the various stages of manufacturing, as well as at the completion of production.

By maintaining this intense level of quality control and developing new methods and techniques to ensure top-quality products, Nature's Sunshine perpetuates its long-standing position at the forefront of the industry. The natural result is a large and growing family of over 200,000 customers—men and women throughout the world who wouldn't think of buying any other brand than Nature's Sunshine.

Testing Procedures and Information

As a company, Nature's Sunshine Products takes enormous pride in the quality of the products we offer. Indeed, quality is the first part of the Nature's Sunshine motto: "Quality, Service and Integrity." In order to produce high-quality products, we start with the finest raw materials available.

We subject each incoming shipment of raw materials to a battery of tests to establish the quality of the material before we use it in any of our products. Because quality is so important, we continually test raw materials and products throughout the entire production process. NSP has invested millions of dollars in high-tech testing equipment to ensure that our methods and facilities are state-of-the-art. And we employ quality control experts who conduct more than 300 different testing procedures.

The health products Nature's Sunshine offers are the very best in the world, and we are committed to leading the industry in product testing and overall product quality. This booklet provides helpful information about some of the tests we conduct so you can better understand the stringent testing procedures NSP follows and can have the utmost confidence in the products we offer.

Raw Material Sampling

Each raw material is sampled according to an established statistical method in order to ensure that the sample is a reflection of the entire lot. The sampling takes place in an isolated sampling room to ensure no cross contamination of other materials. The raw material samples are then delivered to the appropriate Quality

Assurance labs for testing. A sample of the raw material is retained for reference by Quality Assurance.

Microbiological testing

We ensure the quality and purity of our products by utilizing an instrument called a Bactometer. It detects the growth of organisms by the change of electronic signals passed through modules containing test samples. An increase in conductivity in the sample indicates growth of organisms, and the time at which the increase occurs determines the amount of organisms present. All raw materials, in-process samples and finished goods are subject to testing on the Bactometer to verify that they meet NSP's stringent microbiological standards. We were the first company in the nutritional supplement industry to utilize this exciting, new technology.

We were the first company in the nutritional supplement industry to use a bactometer.

Environmental Monitoring

We use two techniques to evaluate the effictiveness of our cleaning procedures. First, we use microbiological swabbing to determine if any organisms are present on a piece of equipment. Through serial dilutions and the plate count method, we can determine the number of organisms present.

Second, we utilize a new instrument that measures Adenosine-triphosphate, or ATP— the energy building blocks in every cell. This instrument (called a bioluminometer) can detect product and sanitizer residue by measuring the bioluminescence (emission of light) of any ATP present on the surface of equipment. The combination of these two techniques ensures that all cleaning procedures meet strict sanitation standards.

Anaerobic Testing

NSP is one of a handful of nutritional supplement companies that has the ability to test for Acidophilus or Bifidobacterium.

Acidophilus and Bifidobaterium are families of bacteria that positively influence digestion and proper intestinal function. These bacteria live and reproduce without air (anaerobic). NSP products that contain these organisms have extremely high counts (millions of organisms per capsule).

We use special testing equipment and analytical procedures to quantify anaerobic organisms. NSP is one of a handful of nutritional supplement companies in the U.S. that has the ability to test for Acidophilus or Bifidobacterium. The standard test requires six complex steps to be completed and takes three days for the final analysis. Our staff has developed a new procedure using the Bactometer that can determine anaerobic test results within a 24-hour period.

Herb and Purity Testing

Organoleptic ID Testing

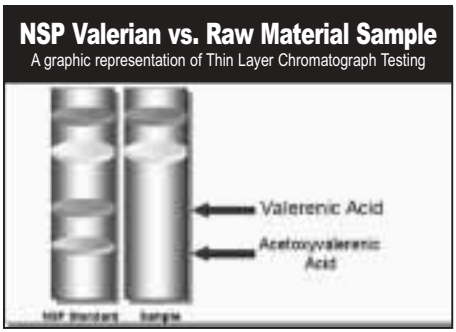
This is usually the first step in the identification of herb samples coming into the Quality Assurance testing area. This analysis includes testing with the senses (checking the taste, odor, color and appearance of the raw herb material). Since herbs are natural products, their characteristics may vary. However, they must fall within a specified range.

Microscopy

A microscopic evaluation is performed on incoming herb samples to validate exactly which plant parts the sample contains (roots, leaves, fruit, bark), and to look for any foreign matter such as insect parts. This test involves the preparation of a slide of each herb powder. By analyzing the cell structure of the sample under the microscope, we can confirm the plant species and cell type (part of plant), and see possible contamination.

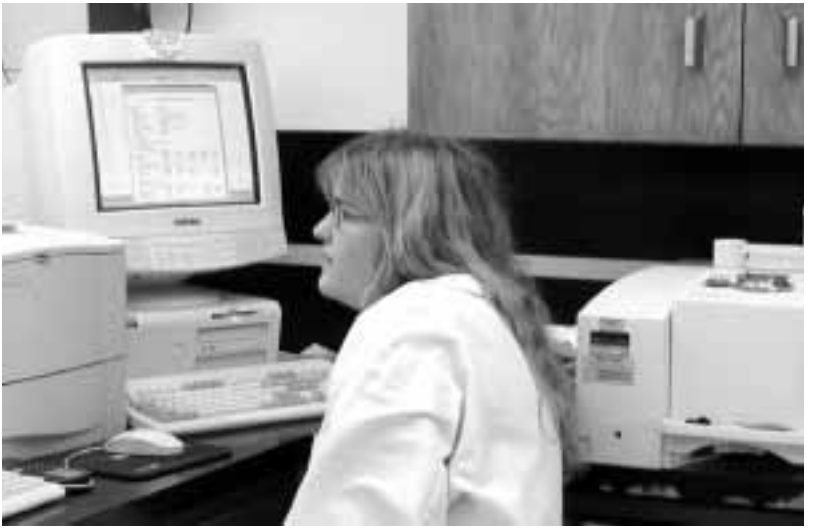
Thin Layer Chromatography (TLC)

TLC is a reliable analytical technique that allows us to identify herbs and measure their quality. Different components of an herb extract are separated from each other using adsorption and capillary action. An extract is spotted onto a plate, and the intensity of the spots represents the concentration of each component in the extract. Trained personnel can identify the components by color and identify colorless substances using a special detecting spray or ultraviolet light.



The herb sample on the right is missing two key constituents, so it is rejected.

The TLC test allows us to "fingerprint" the herb sample and compare it to a library of known standards. By using the TLC test in combination with the FTIR test (page 6), NSP can be assured that the key components in a particular herb are present and in the correct ratio in the raw material.



Infrared Spectroscopy (FTIR)

Its official name is Fourier Transform Infrared Spectroscopy. The FTIR herb test validates the authenticity and purity of an herb sample. A beam of infrared light passes through a sample of the herb. As the beam shines on the sample, the sample absorbs energy from the beam at certain frequencies. If we chart the frequencies at which the sample absorbs energy, we get the "absorption spectrum" of the herb. No two herbs have the exact same absorption spectrum, so by comparing these charts to

Note the difference between absorption spectra
from samples of golden seal and barberry.
golden seal barberry

The Infrared Spectrometer

The main component of an FTIR spectrometer is the Michelson Interferometer.

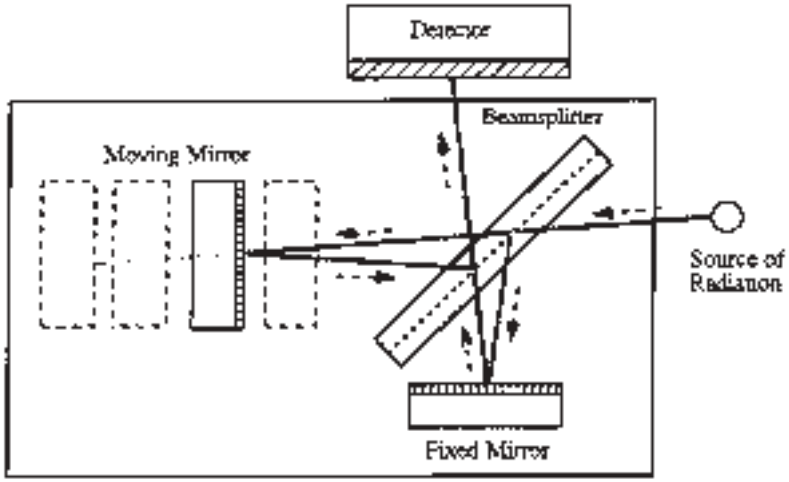


Diagram of the Michelson Interferometer.

existing charts, we can positively identify the herb.

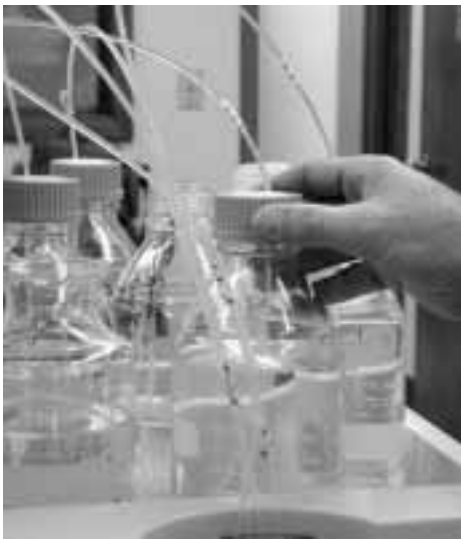
This test is critical because some herbs look, smell and taste exactly alike, but one herb may cost 25 times more than another. Without FTIR testing, vendors may be tempted to dilute more expensive herb material with inexpensive "fillers." For example, golden seal, a very expensive raw herb, has been over-harvested in recent years. As a result, supply is limited. Some vendors may be tempted to dilute their golden seal with barberry, which has a similar chemical composition but is much less expensive. NSP QA chemists can detect adulteration in the raw material and reject the entire lot.

Golden seal is very expensive and has been over-harvested. Some vendors may be tempted to dilute their golden seal with barberry, which has a similar chemical composition.

This test also measures the level of the key components in herb samples so we can maintain consistent levels of potency from one batch of product to the next.

High Performance Liquid Chromatography

This extremely sensitive computerized instrumentation allows us to analyze the ingredients of a mixture. The instrument uses advanced analytical techniques to separate, identify and quantify individual components. Vitamins and active constituents in herbs are tested on the HPLC. These components are measured in all finished products to verify that each lot meets the amount claimed on the label.



NSP tests all finished products to verify that each lot meets the amount claimed on the label.

We also use HPLC to examine the purity and potency of raw materials, particularly herbs that have active compounds. For example, the parthenolide content in feverfew and the ephedra content in ma huang must meet specifications before these materials can receive QA approval.

Foreign Materials Testing

Ash Testing

We burn a small sample of herb material in a special microwave furnace for one hour at 700°C. This burns away all of the organic (plant) matter. Any ash that remains after the burn is mineral content or dirt, which is subsequently weighed.

Every herb has a characteristic mineral content and a corresponding typical ash content. If, in testing, we find an ash content

that is significantly higher than the typical ash content, we suspect the presence of dirt or some other foreign inorganic material. Dirt is a common problem, especially with herbs harvested from plant roots. If harvesters do not take the time to completely clean the dirt from the roots, NSP rejects their herbs.

Acid Insoluble testing

The inorganic ash left after ash testing is treated with hydrochloric acid and burned again. Any remaining ash is called acid-insoluble ash (AIA). A high AIA value may indicate that the herb sample is contaminated with metal particles.

Gamma Counter

Some raw materials that come from eastern Europe may be contaminated with radiation from the Chernobyl nuclear power plant disaster. The Gamma Counter will show us if the materials are contaminated and will help us keep our products free from radiation.

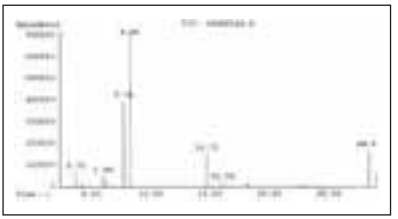
Gas Chromatography/Mass Spectrometry

By using Gas Chromatography (GC), we can separate complex mixtures of compounds into individual components. A sample of a mixture is placed in the GC instrument where it is heated and becomes a gas. As this gas travels through a tube in the instrument, the individual elements in the mixture separate and attach to a special coating in the tube. These separated elements enter a detection unit called a Mass Spectrometer (MS), which graphs individual elements and allows us to identify the compound.

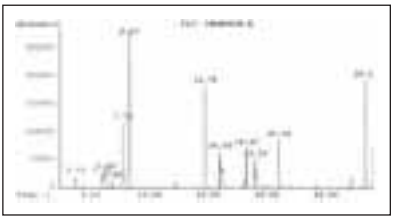
The GC/MS is useful in many ways. By examining these graphs we can look for unwanted elements such as pesticides. We

can measure the pesticide quintozene down to 10 ppb (parts per billion). We also use the GC/MS to analyze essential oils to verify that they contain the proper components, which vary from species to species. For example, Oregano oil from Morocco has different components than Oregano oil from Turkey. This use of cutting-edge technology gives NSP the advantage in ensuring the quality and purity of our natural health products.

The figures below show plots for Oregano Oil from Turkey and Morocco sources. As you can see, each sample has different peaks, which are representative of different components in the oil.



Oregano Oil from Morocco

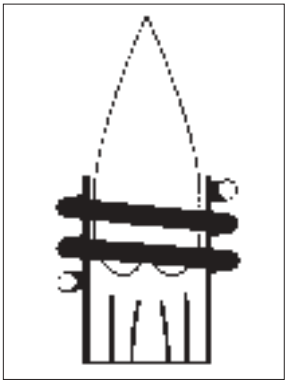


Oregano Oil from Turkey

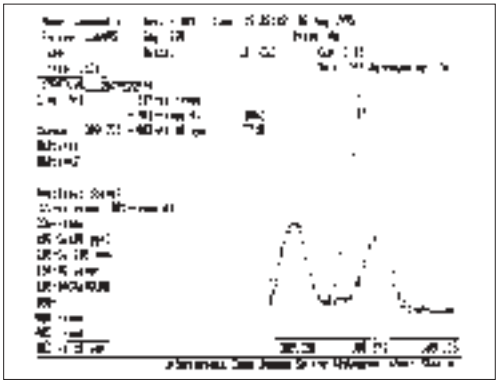
Other Testing

Inductively Coupled Plasma–Mass Spectrometer (ICP–MS)

The ICP has a flame that burns at 8,727°C. We dissolve a sample of raw material or finished product in acid and then spray the solution into the middle of the flame. Inside the flame the



ICP Schematic



ICP Spectral Scan

different elements glow with their own unique colors. For example, calcium will glow with a different color than potassium. A highly sensitive spectrophotometer measures the brightness of each mineral in the flame, and the graph tells us how much of each mineral is present in the sample down to parts per million. If there are any unwanted elements in a test of raw material, the shipment is rejected.

This testing device screens raw mineral samples for unwanted elements like arsenic, lead, cadmium and mercury. The ICP is also used to test finished products like Super Supplemental Vitamins & Minerals™ and Mega-Chel® to ensure their mineral content meets label claims.

Dissolution Testing

This test mimics the digestion system of the body and shows the amount of product that is available for use by the body over time. We use this equipment to test our time-release products such as T/R Vitamin C, T/R Valerian and T/R St. John's Wort. The Dissolution System controls critical environmental parameters for the sample being tested, including temperature, stir rate, sampling time and sampling volume. This close control allows for the highest possible accuracy in testing of our time-release products.

Collected samples are analyzed using extremely sensitive analytical instrumentation such as HPLC or UV Vis analysis. These instruments show the rate at which the compound is released.

Disintegration

Each lot of tablets or capsules produced at NSP must pass the test for disintegration. Tablets and capsules are tested in accordance with the United States Pharmacopoeia. The tablets or capsules are placed in water maintained at 37° C, and the motion of the disintegration apparatus simulates the passage of a tablet or capsule through the body. The time required for each tablet and capsule to break down is recorded, and all tablets and capsules must dissolve within 30 minutes to be accepted by NSP Quality Assurance.

Finished Product Auditing

Once a product has been produced, each lot is statistically sampled, and the finished product is audited by QA inspectors for bulk weight, liquid volume, bottle count, bottle sealing and legible lot number. Samples are then given to the QA labs so scientists can complete testing according to finished product specifications. After all tests are completed, certificates of analysis are signed by QA. The batch record of the product is reviewed to ensure the product was produced by Good Manufacturing Practices. When the product successfully passes the finished product audit, Quality Assurance will release the product. The batch record and a sample of the finished product are retained for future reference. If a customer has a question about a product, QA can refer to the retention sample of the lot in question.

NSP's Most Important Quality Assurance Tests

Nature's Sunshine meticulously tests all the raw materials we receive. Our quality assurance testing continues throughout the entire production process. In all, we use more than 300 tests and procedures to ensure the quality of the raw materials we use and the finished products we sell. The following list represents a few of the most important tests we conduct.

Acid Insoluble testing
Ash testing
Bacteria testing
Dissolution testing
E. Coli testing
Finished Product Auditing
Foreign Organic/ Inorganic Matter
Gas Chromatography/ Mass Spectrometry (GC/MS)
Heavy Metals testing
High Performance Liquid Chromatography (HPLC)
Inductively Coupled Plasma–Mass Spectrometer (ICP–MS)
Infrared Spectroscopy (FTIR)
Microscopy
Moisture testing
Mold and Yeast testing
Organoleptic testing
Particle Size
pH testing
Potency testing
Salmonella testing
Tablet Disintegration
Thin Layer Chromatography (TLC)
Total Bacteria testing
Viscosity testing
Volatile Oil

Every test we conduct leads to better product quality, and excellence in product quality is what has put our products where they are today—at the top of the industry. You can be assured that with each new product we develop and manufacture, our commitment to excellence will continue.

NSP Production Flow Chart