

# GLYCERIN VERSUS ALCOHOL

## Concerning Herbal Liquid Extracts

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### – Thinking Outside The Box –

#### WHAT IS GLYCERIN?

Glycerin, sometimes spelled glycerine, is a commercial product whose principal component is glycerin. The terms glycerin, glycerine, and glycerol are often used interchangeably in the literature.

Glycerin is one of the most versatile and valuable chemical substances known to man. It possesses a unique combination of physical and chemical properties that are utilized in myriad products. Glycerin has over 1,500 known end uses, including many applications as an ingredient or processing aid in cosmetics, toiletries, personal care, drugs, and *food products*, of which herbal liquid extracts are classified. In addition, glycerin is highly stable under typical storage conditions, compatible with many other chemical materials, virtually non-toxic and non-irritating in its varied uses, and has no known negative environmental effects.

*[In other words, glycerin is for the most part... safe! We are here referring to USP grade/Kosher certified vegetable glycerin when making this assertion. – LCR]* A water clear, odorless, viscous liquid with a sweet taste, glycerin is derived from both natural and petrochemical feedstocks. It occurs in combined form (triglycerides) in all animal fats and vegetable oils and constitutes, on average, about 10 percent of these materials. Glycerin is obtained from fats and oils during soap and fatty acid production and by transesterification (an interchange of fatty acid groups with another alcohol). It is subsequently concentrated and purified prior to commercial sale. Synthetic glycerin is produced from petrochemical building blocks via several processing steps designed to achieve the desired concentration and high product quality. *[Used typically for pharmaceutical reagent work and pharmaceutical production, and highly technical applications, but NOT for food-grade use! – LCR]* Glycerin, whether recovered from triglycerides or synthesized, is principally used as a highly refined and purified product, with a very high concentration of glycerin.

Glycerin, the main component of glycerin, has the chemical formula  $C_3H_5(OH)_3$ . It is a trihydric alcohol, possessing two primary and one secondary hydroxyl groups, which are its potential reaction sites and the basis for glycerin's versatility as a chemical raw material. For example, glycerin esters, the reaction products of glycerin with various fatty acids form an important class of derivatives that are extensively used in the food industry. The physical properties and characteristics of glycerin are as significant as its chemical properties for many applications. These qualities enable glycerin to be used as a humectant, plasticizer, emollient, thickener, solvent, dispersing medium, lubricant, sweetener, bodying agent, antifreeze and processing aid. It is not unusual for glycerin to contribute two or more features or attributes to a product or application. In all applications, whether as a reactant or as an additive, the virtual non-toxicity and overall safety of glycerin is always of significant benefit. Glycerin applications appear to be limited only by the imagination and creativity of the scientific and technical communities. *[It is this final statement of "imagination and creativity" that compelled L. Carl Robinson to invent the multi-step TincTract® process for using glycerin as a primary solvent medium. – LCR]*

Most of the glycerin marketed today is manufactured to meet the stringent requirements of the United States Pharmacopeia (USP) and the Food Chemicals Codex (FCC). However, technical grades of glycerin that are not certified as USP or FCC are available. *[For herbal glycerite purposes only the USP FCC grade vegetable glycerin is used. – LCR]* Glycerin is used in many consumer products such as personal care preparations, cosmetics, pharmaceuticals and foods because of its contribution to product properties,

stability and compatibility with a wide variety of chemicals, and relative non-toxicity. For these consumer-oriented applications, the quality and purity of the ingredients is crucially important. The use of USP and FCC- certified glycerin, versus technical grade glycerin, in consumer product applications ensures that the manufacturer has specified the glycerin quality and consistency required for these products. *[As previously stated, only USP grade/Kosher certified vegetable glycerin is used. – LCR]*

Compliance with USP and FCC requirements means more than meeting the specifications given in the USP and FCC glycerin monographs as determined by analysis. It also means strict compliance with FDA regulations, most particularly with the procedures outlined in the current Good Manufacturing Practices to assure plant and equipment cleanliness and to avoid contamination during handling, distribution or packaging. Plants, warehouses and clean rooms, where repackaging is done, are subject to FDA inspection. Complete record keeping is obligatory to ensure that every shipment of product is traceable by lot number. A Certificate of Analysis also accompanies every shipment of USP and FCC glycerin. *[The manufacturers who supply glycerin for TincTract® brand processed liquid herbal glycerites meet these standards. – LCR]*

Text is taken from 'The Soap & Detergent Association' website with inserted comments by L. Carl Robinson, MH,TT,CCHt (i.e. *[..... – LCR]*). We thank 'The Soap & Detergent Association' for their well written and easy to understand information.

## **WHAT DOES 'USP' AND 'FCC' MEAN?**

The abbreviation USP stands for United States Pharmacopeia, a document first published in 1820 by the Medical Society of New York State. Recognized as official by Congress in 1848, this document was used as a standard reference by physicians for prescribing medicines. Today, the USP includes chemical descriptions, identifying tests, and purity tests, primarily for active ingredients. All materials listed in the USP are considered drugs by law and subject to all the U.S. Food & Drug Administration requirements pertaining to drugs. Labeling a product or a substance as USP implies that it conforms to all the legal requirements of the FDA and that it was produced in accordance with the principles outlined in FDA's Good Manufacturing Practices (GMP). A new edition of the USP is published every five years in the years ending in "0" and "5," with ongoing revisions and additions issued during the interim years.

Many other nations also have compiled an official national pharmacopeia, similar in scope and content to the USP. Currently, there is a collaborative international program to harmonize the glycerin monographs in the USP and in the European Pharmacopeia, which may later be expanded to include other nations.

The abbreviation FCC stands for Food Chemicals Codex, an internationally recognized compendium of monographs covering food ingredients. It contains specifications for many direct food additives, such as glycerin. The Institute of Medicine of the National Academy of Sciences developed and maintains the FCC. The FDA also supports this compendium. The specifications for food grade glycerin given in the FCC are generally comparable to those given in the USP.

A definition of USP and FCC has been included in this presentation since the Kosher certified vegetable glycerin used in TincTract® brand processed liquid herbal glycerite products is not only G.R.A.S. listed as a food ingredient (as opposed to a food *additive*), but is both USP grade and FCC listed.

## **WHAT IS cGMP?**

Current Good Manufacturing Practices (cGMP) is a series of documents governing every aspect of the production and shipment of FDA regulated and/or oversight products, from personnel management to the cleanliness of manufacturing facilities to labeling. cGMP is mandatory. TincTract® brand processed products are produced in accordance with the principles outlined in cGMP. For foods and active drugs, the cGMP guidelines are given in the Code of Federal Regulations (CFR), Title 21, and are referenced in the current editions of USP and FCC.

cGMP requires separate or defined areas for raw materials, in-process materials, and completed products to prevent contamination or mix-ups. Traffic must also be controlled to minimize contamination.

Requirements for lighting, ventilation, water supply, building maintenance, and refuse containment and disposal are also outlined in cGMP documents, to which TincTract® brand processed products are compliant.

## **GLYCERIN – A PROTEIN, FAT OR CARBOHYDRATE?**

While loosely classified by the FDA as a carbohydrate, this category placement was decided upon by default only. Glycerin cannot be listed as a fat since it does not contain fatty acids, and it cannot be listed as a protein because it has no amino acids, therefore the only remaining macronutrient of caloric value was carbohydrates. (Presently, the National Academy of Sciences has not been inclined to add a 4<sup>th</sup> caloric based macronutrient category, hence the FDA's default listing of glycerin as a carbohydrate.)

There have been attempts in some well meaning but purely agenda driven science and industry circles to define glycerin (also known as glycerol) as a 'sugar alcohol.' It is ironic that the American Dietetic Association, the leading venue for dissemination of information on accepted scientific and governmental policy on nutrition and diet in the United States, does not list glycerin as a sugar alcohol among a lengthy list of officially recognized sugar alcohols. There is a reason for this.

Technically a sugar alcohol is typically, but not always, defined as any compound that ends in 'itol' (i.e. sorbitol, mannitol, xylitol, etc.). Two other points defining 'itol' sugar alcohols also includes that 'itols' are typically derived from hydrogenation and are referred to as polyols. Glycerin is not a polyol (it is technically known as a trihydric alcohol) and is not derived from hydrogenation, but from a process known as 'fractionation' – a totally different process altogether which results in a much safer and more natural end product than hydrogenate produced sugar alcohols.

Glycerin, while being its own unique caloric category, should continue to be included in the macronutrient arena, even though it defies clear categorization according to currently accepted macronutrient listings. One thing for sure, glycerin is not a sugar alcohol, no matter how hard chemists and government bueraucrats attempt to redefine and categorize it in their 'an apple into an orange' fashion.

## **TincTract® Processed Liquid Herbs – 100% true Alcohol-Free –**

The TincTract® brand glycerin processing technology, now in a 6<sup>th</sup> generation iteration, is a commercial process whose proprietary aspects are known only to L. Carl Robinson and key personnel at the company that exclusively utilizes this unique processing technology. Though trade secreted, the TincTract® brand process is fully documented and securely kept. It is not intended for this presentation to be a commercial ploy at advertising a specific company's products or the like, however, due to the fact that only one company incorporates all the principles and complete manufacturing protocols as outlined in this presentation we are left with no choice but to at least refer to the process name specifically – as the *TincTract® brand*. Therefore, necessity dictates that the TincTract® brand process be referred to specifically by name, since its processing technology is not in the public domain or done by any other endeavor. Therefore, relative to this presentation, wherever 'TincTract® brand' is referenced, described or otherwise, it is for informational and descriptive purposes only and not for commercial advertisement purposes.

## **Glycerin versus Alcohol**

TincTract® processed liquid herbal products are a 'Premium' class of herbal products. (See Appendix B for definition of the word *TincTract®*.) Every step of the TincTract® process is totally alcohol-free. Alcohol is NEVER used anywhere in the process. The exclusive TincTract® process preserves extracted water-soluble and alcohol/heat sensitive components such as aromatics, vitamins, enzymes and other important constituents, that are diminished, denatured, rendered inert or altered in alcohol based processes. These are proven scientific facts! These facts are also withheld from consumers by companies who process their herbal products with alcohol. Most surprising of all, many companies are not even aware of the intrinsically deleterious effects of alcohol on the herbs they process and sell. Am I saying that alcohol

processed herbal products have not place in the clinician's dispensary or on a store's shelves? No! What is being said is that many important facts concerning alcohol processed herbal products are either withheld from consumers, outdated in their premise or simply not realized by the makers of these types of products. The latter two points will be addressed later.

It is recognized that glycerin, amount for amount, is second only to alcohol in outright disinfecting-antiseptic action, and if that were all there is to be concerned with as to the subject of glycerin versus alcohol relative to liquid herbal products, nothing more would need to be said. But there is more – much more indeed.

#### *Grain Alcohol's Intrinsic Nature*

All simple (diatomic) grain alcohols denature and render inert many of the therapeutic actions of an herb's extracted aromatic constituents (excepting their antiseptic/bacteriostatic action). A long standing premise of chemistry states that if the structure of something is changed, then the outcome (i.e. effect) of that something will be changed as well. The structures of essential oils, glycosides, etc. of a plant are changed. These essential oils and glycosides are major contributing factors to many herbs therapeutic values. The perfume/fragrance industry knows this and often requires that alcohol be used for denaturing of the high grade essential oils used in their fragrances as part of preparing their scents for the marketplace so as their products maintain the scent/aroma quality, while being void of therapeutic implications (commonly known as 'emotional triggers') that could potentially cost them sales and market share.

Vitamins, enzymes, co-factors and other micronutrients are denatured and rendered inert when brought into contact with alcohol as well. This is due to alcohol's disinfecting, sterilizing and dissociating qualities. True, important marker constituents and compounds may be removed by alcohol solutes, but to what end? If those constituents and compounds are denatured and biologically inert due to alcohol's intrinsic ability to do so, then those same constituents and compounds would also be diminished or of no value in biological systems due to their denatured and/or inert state. Just because something is removed and present in a compound does not mean that something will be biologically active or utilizable to the degree represented. *How* something is removed is as important as what is being removed due to the effect that the 'how' removed will definitely affect the state of what is being removed. These are all scientifically verified facts!

#### *Compensating For an Intrinsic Weakness of Alcohol*

Though not consciously realized by many manufacturers themselves, is it possible that the denaturing/inert rendering aspect of constituents is one of the driving forces behind why many manufacturers of alcohol-based herbal products have turned more and more to pharmaceutical-based isolate/fractionate technologies. Super-saturating their liquid extracts with a high enough level of a given marker constituent (that may now be denatured and/or inert) has the resultant effect of 'forcing' a viable metabolic pathway of the denatured/inert rendered constituents in the body's systems, that might otherwise require much less of that exact same marker constituent(s) if it was in an intrinsic synergistically balanced biologically active non-denatured state – not too dissimilar to the difference that's been noted for needing far less of a natural cold-processed source of biologically active pro-vitamin C versus the otherwise high amounts of heat/solvent processed crystalline vitamin C to get a similar benefit. Again, because a given amount of a marker compound is present, doesn't necessarily mean it possesses the high synergy driven biological activity it formerly possessed in the raw unprocessed state or increased efficacy thereof, especially when the type of 'solvent' for extracting a compound and the methodology used for doing so is taken into consideration.

#### *Alcohol's Many-Fold Problematic Nature*

Grain alcohol is also implicated as being problematic for either causing or aggravating many health problems, from the subtle to the profound. Grain alcohol in any form is contraindicated for pregnant mothers (which includes pregnant pet's as well) and recovering/recovered alcoholics, who often 'trigger' even with so called, "alcohol-free" products that were actually processed with alcohol and then had the alcohol removed. It's as though the 'energetic' signature for alcohol seems to remain. Alcohol not only denatures, renders inert and/or destroys many vitamins and pro-vitamins in herbs, it has been documented

to destroy many nutrients in the digestive tract as well. Would the same apply to a gross grain alcohol extractive/tincturing component in finished non re-distilled liquid herbal products? (As opposed to a said herbal tincture mixture further being distilled into a true ‘liquor’ which are known to possess distinctive health benefits), [please see Appendix B to this presentation for more referenced details on the deleterious effects of straight grain (ethyl) alcohol’s effect on nutrition, metabolism, etc.]

Even though alcohol may be a great sterilizing agent (due to its disinfecting and dissociating nature) it renders inert so many constituents and nutrients that an ethyl grain alcohol-based product, though possessing a modicum of therapeutic efficacy, is still actually very limited in its potential and therapeutic benefits, especially those nutritionally related, when compared to the broad benefits contained in a TincTract® processed liquid herbal glycerite.

#### *Glycerin’s Highly Versatile Nature & Intrinsic Stability*

This is not to say that an alcohol prepared herbal product doesn’t have its place. It’s just that it is becoming more evident to those who use both types of preparations that a fair and comprehensive evaluation supports the premise that TincTract® processed glycerites are more versatile in their applications (as opposed to other types of processed glycerite products), and because of glycerin’s non-denaturing/inert rendering quality and stability, the constituents and compounds retain more of their synergistic and biologically active nature, thereby requiring less of a given active constituent or compound than an alcohol extracted process would require. On the other hand, the driving need for alcohol-based processes to super-saturate their products becomes obvious. Possibly one of the saddest fact’s of almost all super-saturate based extraction technologies is the incredible wastage of partly spent herbs and the pressure it puts on the growing of herbs, especially those of questionable sustainability, that are becoming more and more popular in the marketplace.

TincTract® brand processed liquid herbal products simply possess a versatility previously not available in a glycerite product, a fact that does not go unnoticed by health practitioners, herbalists and consumers alike. TincTract® processed herbal products can be taken straight, with water, in juices and even sprinkled over foods, all without tainting the taste or quality of the medium to which a TincTract® brand herbal glycerite is added.

#### *Source of The Misconceptions, Misunderstandings & Misrepresentations Surrounding Glycerin*

So why is grain alcohol listed as it is in the texts dealing with making liquid herbs and so dogmatically accepted in the industry at large as the ‘preferred’ extractive medium for liquid processing of herbs? The answer lies in the early research and assumptions made by the botanically based eclectic physicians of the mid 1800’s and early 1900’s. These holistic physicians (MD’s and ND’s) who are legendary for their safe, sane and very effective *eclectic* approach to doctoring also became very involved in the emerging pharmaceutical search for herbal based crude drug medicines. For the time period they worked in, their research and work was astounding and in many areas groundbreaking. Part of that early research involved determining what they felt would be the most universal and ‘preferred’ extractive medium for liquid processing of medicinal botanicals. In the end they settled on grain alcohol and made that the ‘standard’ extractive medium – a tenaciously held-to premise that still prevails in the liquid herbal products industry at large today. This premise was clearly stated in 1869 by the eclectic physician William Cook, MD, when he said, “*Glycerin possesses a peculiar and powerful solvent property, and is also an excellent preservative. For both these qualities, it is second only to alcohol, and deserves to come into considerable use.*” (It should be noted that the last part of Dr. Cook’s statement was never really taken to a level of serious consideration by his peers or later eclectics, instead they dogmatically opted for grain alcohol as the dominant, and in most cases, exclusively preferred extractive medium and largely excluded glycerin.)

However, within 20 to 50 years following the Eclectic’s work in this area three very important things would challenge and even invalidate the early assumptions that grain alcohol was the preferred medium for liquid extraction and preservation of liquid processed botanicals.

### *Enzyme Theory*

Firstly, at that time the eclectics did not have enzyme theory to consider into the implications of their work, not only as related to processing of botanical products, but most importantly, relative to the ‘actual’ denaturing and inert rendering effects of alcohol processed liquid botanical preparations both therapeutically and nutritionally. Without this knowledge, they could not possibly, beyond their meta-science premise, have been aware of the ‘biologically’ active nature that enzymes and certain enzyme co-factors play in the therapeutic and nutritional efficacy of an herb, which alcohol intrinsically denatures, dissociates and renders inert. In fact, enzyme theory was decades away from being theorized and elucidated and another decade before the effects of alcohol on enzyme and enzyme co-factors would begin to be understood by science.

### *Unrealized & Unmatched Versatility*

Secondly, though they utilized glycerin in a number of their experiments, the Eclectics appear to have not been aware of and/or confident in its enormous *versatility* as an extractive solvent, and with the exception of decoction processing, largely utilized it in an alcohol-type extraction manner (possibly due to two factors – 1, that chemically it is technically an alcohol, but a tri-atomic one, like comparing sugar (grain alcohol) to a complex polysaccharide carbohydrate (glycerin), and 2, the Eclectics did not have (or attempt to develop) the specialized processing technology and implements for processing glycerites available to them at the time). In other words, whatever the reasons, they didn’t *work* the far greater spectrum of glycerin’s versatility beyond the critical narrow limits intrinsic to grain alcohol. Why they didn’t do so, no one really knows.

Even so, within 20 to 30 years of the Eclectics premature assumptions concerning alcohol versus glycerin, the food products industry and industrial manufacturing would reach the zenith of glycerin based research relative to food use, medicine and veterinarian use and conclude, through both industry and scientific research, that glycerin is not only the most versatile naturally occurring extractive medium’s yet discovered, but one of the safest as well. The key that the Eclectics had missed was not so much whether glycerin was a good extractive medium or not (which they assumed was less versatile than grain alcohol in its extractive qualities) but *how* glycerin is worked and used in the processes it is used with to bring out its intrinsic versatility. The *working* of glycerin in the liquid extract process is precisely what L. Carl Robinson did when he invented the TincTract® process. So the Eclectics simply were not aware of glycerin being much more versatile and a better extractive medium for botanicals than grain alcohol could ever be, because they did not have access to research and facts to give them greater clarification, nor had they ventured further beyond their own original alcohol-based & premised R&D of glycerin’s use to find out.

### *Non-Denaturing/Non-Inert Rendering Nature of Glycerin (as opposed to Alcohol)*

And thirdly, it was noted in the late 1960’s/early 1970’s and further observed in the 1980’s by clinical aromatherapists that certain therapeutic benefits of essential oils and aromatic based compounds of a plant might be denatured and/or altered (often times dissociated into simpler inert compounds) when placed in contact with grain alcohol. Though the aroma quality remained, the therapeutic benefits were substantially reduced and/or rendered inert due to alcohol’s action of taking extremely complex molecules and breaking them down into simpler component molecules. (Perfumers are aware of this due to the fact that they often spike a naturally derived aromatic blend of essential oils with a bit of alcohol to ‘fix’ it, or in this case, purposefully render it therapeutically inert.) This aspect of alcohol’s effect on the aromatic constituents of a plant was totally unknown to the Eclectics. The Eclectics were also not aware of glycerin being a superior solvent to that of alcohol in removing essential oil content from plants, since this part of glycerin research would not come to light until the early 1940’s. In fact, glycerin has been found to be an excellent non-rancifying and non-denaturing agent for preserving aromatic compounds and essential oils specifically.

Today, many accomplished clinical aromatherapists have noted similar observations and share a similar feeling among their professional peers in regards to their own practices, even stating that they refuse to add grain alcohol to any of their blends for the very reasons conveyed in this presentation.

### *Time to Question and Rethink Outdated Assumptions*

Given the above evidence, has the time approached where the status of grain alcohol being the 'preferred' extractive medium for herbs needs to be declared and understood to be outdated and no longer supported in either a scientific or intrinsic (evidence based) sense? For most of a century a premise, that was outdated within 20 years of its introduction, has been dogmatically held to while the facts clearly show differently. It appears that though more expensive, glycerin is nevertheless more versatile, safer, and beneficial than alcohol is intrinsically capable of, thus making glycerin the better value overall.

### *Glycerin Has Greater Solvent Qualities Than Alcohol*

Following the eclectic era and their published works, glycerin was further researched by the foods sciences, medical, and manufacturing industry and thereafter listed in foods ingredients and industrial texts as possessing the greatest [naturally occurring] solvent powers known for a natural solvent, exceeded only by water itself (only because water is able to take on the three states of matter). This means glycerin has greater solvent qualities than alcohol! Not the other way around. The problem in the past, presently besetting the liquid herbal products industry at large, has been that accepted standard glyceric-extractive processes typically utilize distinctly alcohol-type liquid extraction techniques for fluid-extracting herbs, which makes these particular glycerite preparations very limiting, and not all that much stronger or any more efficacious than alcohol based herbal products, – often being less so. In other words, glycerin being treated as if it were alcohol is akin to treating and using sugar and honey the same way in a baking recipe. Since baking recipes are sugar based, using honey the same way will result in a baked item that is less sweet and off from that of when sugar is used. Not too dissimilar to the comparing apples-and-oranges and stating that they are both apples. Such has been the case with the glycerin vs alcohol controversy.

Over 20 years ago L. Carl Robinson, Clinical & Formulary Herbalist, who conceived the TincTract® process, realized that to obtain the full solvent potential of glycerin as an extractive medium, it needed to be put through a series of steps that involved much more than a mere alcohol-based 'cold' tincture technique, simple percolation, or a reducing decoction process. The TincTract® process is a "Thinking Outside The Box" approach that challenges many hard-and-held-to industry standards and dogmatically held to notions about alcohol-type dominated fluid extraction processes. The TincTract® process, a multi-step *synchronous serialized* extraction technology, consistently results in finished products that often leaves stores and practitioners, other herbal product companies, and the foods & beverage industry scratching their heads in wonderment. All because of **how** glycerin is worked in the proprietary TincTract® process.

### *Glycerin's Other Many Pluses*

- Unlike alcohol, glycerin is not only a food ingredient in tens of thousands of food products, but is also listed as a nutritive – For both humans and animals! The nutritive qualities are astounding! Though it has caloric value, the calories are not *simple* carbohydrate-like calories as sugar or alcohol is – that each metabolically blast through the body, cause blood sugar crashes, result in excess fat, and imbalance blood sugar levels. Instead, glycerin is processed very slowly in the body, utilizing a special enzyme pathway in the liver (called the 'gluco-neogenic cycle') that doesn't stress or damage liver function or tissues, and in fact, has a vivifying effect on the liver as well as not stressing the pancreas, thyroid or adrenals. Alcohol cannot claim any of these features or resultant benefits.
- Unlike alcohol – that has a potentially deleterious effect on the liver (and cannot be metabolized by animals at all), glycerin possesses detoxifying attributes that are non-stimulating (especially important for challenged livers). Dr. Edward Shook, the eminent physician and biochemist who specialized in liquid herbal glycerites, taught that glycerin possesses the distinct quality of aiding in the removal of sequestered toxins from the body's tissues, especially the liver's tissues, a quality not shared by alcohol. This is especially important in today's environmentally polluted and chemically laden world.
- The glycemic index and glycemic load for glycerin is very low. The glycemic index and load are the same for alcohol, however, alcohol possesses a very high hypo-glycemic index that super stimulates the pancreas into over producing insulin while suppressing the liver's ability to produce glucose for balancing the high

insulin levels, potentially leading to hyperinsulinemia and eventual pancreatic failure (diabetes). Glycerin possesses neither a high glycermic or hyper-glycemic index. This is especially important for individuals already experiencing diabetic, hypoglycemic or hyperinsulinemia problems, as well as those on special 'low carb' diets. In fact, though the FDA requires that glycerin be listed on a food or dietary products label as a *carbohydrate* source of calories (due to the National Academies of Science only recognizing fats, proteins and carbohydrates as sole sources of food/dietary calories) FDA also allows for glycerin to be listed as having a '0' Net Carb Count, meaning that it does not act the same way in the body as a true carbohydrate does. Therefore, it really is not a *true* carbohydrate. (Due to alcohol not being classified a food or dietary ingredient, it is currently not required to be listed as a calorie/carbohydrate source on labels, even though it is a clearly verified source of calories derived from carbohydrates!)

- For children, who don't have well enough developed enzyme systems to convert or metabolize alcohol into sugar, glycerin is a perfect ingredient for liquid herbal products for children, and it makes the more bitter and astringing herbs actually taste better, a real plus for children (and parents too!). The ever present problem and reputation for which liquid herbal products at large are typically known for – bad taste! – is not a problem for a TincTract® brand processed liquid herbal glycerite product, especially the formulas.

- Glycerin is non-corrosive, therefore it does not affect metals, minerals or mineral bound constituents susceptible to reduction-oxidative (REDOX) processes when in a fluid suspension, making it an excellent preservative medium for foods and herbs particularly high in REDOX sensitive minerals and compounds as well as acting as a *micro-encapsulating* buffer in liquid formulations where highly REDOX sensitive mineral rich herbs might be mixed with herbs of high organic acid content (which would in a solution accelerate REDOX activity substantially), thereby retarding and/or arresting REDOX activity of essential REDOX sensitive minerals and mineral based compounds. This same REDOX moderating effect of glycerin also applies to the aromatic constituents.

- Unlike many other solvent/water based solutions, glycerin/water based solutions do not become *inverted* after a period of time, meaning that glycerite solutions remain clear, limpid and maintain their suspension quality long after many other solutes have inverted (of which alcohol solutions are very susceptible to). Another little known fact concerning glycerin's positive effect on solutions has to do with the established fact that old wines kept in barrels and having a greater market value than new wines, are characterized by a higher proportionate glycerin content, which may explain why these wines typically possess a lower REDOX value and hence, retain a smoother finish and more mature character. (Many experienced vinters of wine maintain that managing alcohol content is secondary to managing glycerin content for producing a fine wine of premium quality.)

#### *Safer and Preferred For Veterinarian & Pet Care*

In veterinarian medicine glycerin is listed for many uses both medicinal and nutritive. Except for critical short-term dose-monitored use by an animal health care specialist, alcohol should not be used in any form with animals, as they do not have the enzyme systems to convert or metabolize alcohol. Heart, nerve and liver damage, and chronic digestive problems are just a few of the potential problems a pet can have when given alcohol based products, especially over long term use. Glycerin's use in a TincTract® processed pets liquid herbal products line is a real plus, as it also taste's good for the finickiest of pets.

#### *A Glycerite's Superior Absorption (as opposed to Alcohol)*

There is a popular notion that an alcohol based liquid herbal products constituents and compounds are the most readily absorbable of all herbal preparations, some say immediately and even more so than herbal glycerites. This is an assumption based only on personal opinion and not on scientific, clinical or physiological facts. Such assumptions have simply never stood up to scientific scrutiny, clinical review and are contrary to the known effect on tissue responses. Consider this: Students of medicine know that alcohol is not the best medium for introducing something into the body through ingestion (oral) if immediate absorption is the goal. In fact, alcohol causes tissues to initially pucker and contract and has the added effect of drying and dehydrating tissues – *actions that distinctly block absorption!*

On the other hand, TincTract® processed liquid herbal glycerites, due to the succulent nature of glycerin, possess a high degree of absorption and bioavailability. One indicator of this is that glycerin initiates an immediate salivation response which draws the blood and lymph vascularity of the mouth to the surface and brings enzymes essential to absorption into action, an effect completely the opposite of alcohol. Another indicator of glycerin's superior absorptive enhancing properties is that it has a distinctive moistening quality due to its intrinsic humectant action. In veterinary medicine, glycerin IS used as a preferred carrier for many medicines in preference to alcohol. No wonder more and more veterinarians and pet care specialists like TincTract® processed pets products so much.

*Glycerin's Absolute Preservative Qualities As a TincTract® Brand Solution.*

A TincTract® processed product also has a well established and proven preservative quality unmatched by any other glycerite based liquid herbal product in the industry. Why? Because the appropriate glycerin to water ratio for each specific herb processed is used – it is one of the reasons why a TincTract® brand liquid herbal product passes a safety (burden) analysis for the beverage industry and can be rated as acceptable for cold fill purposes. (For nay-sayers of glycerin's antiseptic-like preservative qualities, read the previous sentence again.) This quality is naturally a part of all our liquid herbal products as well, since the same GMP compliant manufacturing and packaging standards are utilized across the board by the manufacturer of TincTract® brand processed products.

It should be further noted that alcohol does not 'preserve' per se, but sterilizes by its vitality zapping disinfecting nature. To *preserve*, a medium must capture and *maintain* the prior original ratio-intact synergistic biologically active state of an herb's components. Glycerin does this with stability, but it is not possible for alcohol to do so, therefore alcohol is not a *true* preservative, but instead a pseudo-preservative.

Also, though both glycerin and alcohol both possess 'antiseptic' qualities (the quality of keeping a finished product pure and safe) the means by which this antiseptic action is rendered is very different for each. Alcohol's antiseptic action is via a direct chemical action upon the fluid medium (the 'disinfecting' factor) whereas glycerin's antiseptic action is via its hygroscopic action on germs, spores, etc. (wherein germs, spores, etc. are deprived of moisture – the culprit in spoilage, decomposition, etc.). (*see Appendix A for more technical details.*)

The manufacturer of TincTract® brand processed liquid herbal products also does bulk ingredient manufacturing to the beverage industry, cosmetic/personal care products manufacturers, and the foods manufacturing industry. These 'bulk ingredient only' accounts require ingredients from this producer that are not only totally 100% alcohol-free and are flavor-rich, but can also be 'cold filled' or 'cold packed.' This means a TincTract® brand processed ingredient has to possess a high degree of 'aseptic-type' qualities.

This should put to rest once and for all the concerns and arbitrary or misguided misinformation concerning glycerin being a poor preservative medium, especially regarding a TincTract® brand processed liquid herbal glycerite.

*Identifying The Actual Problem With Typical Glycerites*

To be accurate and fair to the industry, it should be recognized that there is a justification, albeit limited, for prior concerns and doubts of glycerin's preservative quality, which also explains the basis for the prevalent and overstated misinformation. The following relates only to 100% 'true' alcohol-free based glycerite products, not the alcohol processed then alcohol removed then replaced with glycerin products. (Just keeping things Apples-to-Apples here.)

Other companies dealing in glycerite-extracts of herbs typically contain 60% down to 50% glycerin content in their finished products, some even less! This is more economic, to be sure, but does not result in the potency, consistency and quality of a finished TincTract® brand processed product or comply with the tenets of a total TincTract® process as conceived of by L. Carl Robinson, Clinical & Formulary Herbalist, in collaboration with Steven H. Horne, Herbalist AHG and past president of the American Herbalists Guild, especially concerning the *absolute* preservation quality a *true* TincTract® brand

processed product possesses and to which glycerin is intrinsically known to possess – provided glycerin is used accordingly.

Texts on the subject state, and years of personal and company based experience, show that preservation can be obtained with liquid herbals at the stated minimal 60% glycerin content for an herbal glycerite. However, years of producing TincTract® brand liquid herbal concentrates has decidedly shown, on innumerable instances, that this only works in two instances, and on a limited basis at that. First, the glycerite must be hot (i.e. pasteurized) in its entirety or flash UV sterilized upon being bottled and sealed, and secondly, once the finished glycerite product is opened by the end-user, only in very few instances with certain specific herbs or certain types of formulas, will the opened product remain contaminant free throughout the duration of an opened bottle's usage. In all cases, this minimal stated glycerin content will still need to be refrigerated after opening. The situation gets even more critical, both as to quality and potency as well as being contaminant-free and preserved, if this minimal threshold for glycerin's preserving action (i.e. 60%) is lower in the finished product (which most non-TincTract® brand processed glycerite liquid extracts are).

For instance, one company (a competitor) has personally admitted to Mr. Robinson that they use an across the board 50/50 glycerin/water blend that does not involve a viable *finishing* process anywhere along the way. There is even indications that they now use an even more dilute glycerin concentration in their products to cut costs, which can only reduce their products preservative (i.e. antiseptic) potential, as well as substantially reduce their products potency and quality. This means that many herbs and formulas that are especially susceptible to molds and bacteria in dilute glycerin solutions, such as the mucilants and very alkaline single herbs and herbal combinations, would not have a strong enough antiseptic action to counter these contaminants once in a liquid form, as well as increased REDOX. To counter this they use, according to their own published admission, flash UV sterilization to disinfect their finished products at the point of bottling/sealing. The problem of using flash UV radiation disinfection technology is twofold.

First, once the product is opened and exposed to the air, bacteria and spores are immediately reintroduced into the product where the medium has so little antiseptic action they quickly multiply in this super dilute pseudo-preserved glycerin/water medium thereby posing serious health problems for consumers. Here's where the claim that alcohol is a better *sterile* medium might actually apply and be preferred, regardless of alcohol's other mitigating effects on an herb's components.

The second problem poses a serious product quality problem relative to the intrinsic nature of a product's constituents and phytochemicals, particularly where a cold extraction process is utilized for preserving alcohol and heat sensitive components. It is well known that UV alters and/or destroys many of the very things a liquid herbal process is intended to remove and preserve in their stabilized bioactive state. It can be safely assumed that even flash UV sterilization would possess a similar potential for doing so as well.

Enzymes, certain vitamin cofactors, many phyto-constituents, active components and certain highly reactive aromatic compounds are changed or destroyed by both sustained and intense (flash) UV radiation – in many instances, not too different in its effects from many of alcohol's denaturing and inert rendering actions. Like many alcohol processed products, it has been observed that quality varies dramatically from batch to batch where flash UV radiation sterilization technology is used for herbal glycerites due to its effects on things even as simple as color consistency.

This is not to say that flash UV sterilization does not have its place, even in our industry, especially where safety and purity are concerned. But if it is used for liquid herbal glycerite products it needs to be realized that this is the strongest indicator that the manufacturer is using a dilute amount of glycerin in the liquid extract medium, thereby necessitating its use, and hence, a distinct indicator of potentially low quality and potency, inconsistent efficacy, and questionable safety once the product is opened. It is upon these latter points that the industry is justified in its assessment of *typical* herbal glycerite product safety. However, to say that *ALL* glycerites don't meet preservative/antiseptic quality standards is not only an unfounded premise, but is patently not true, especially where a TincTract® brand processed products are concerned.

Depending on the product, all liquid herbal TincTract® brand products are processed in a proprietary prepared glycerol-water base that is at the properly established glycerol/water ratios (that exceeds the 60% minimum glycerol content for a finished product) which results in astounding extractive qualities and possess incredible aseptic-type preservative qualities as well. Stringent analysis for purity and safety by independent laboratories of TincTract® brand processed products consistently verifies this. In fact, Mr. Robinson still has some original TincTract® processed liquid herbal samples he made, and every three to four years he opens them and performs organoleptic tests (i.e. color, taste, tactile sensation, spore activity, etc.). Not one of them has degraded (including the color remaining stable). All show continued aseptic-type quality, and have remained as flavorful and effective as the day he made them – over 20 years ago! And no – TincTract® brand processed finished products are not pasteurized, irradiated or flash UV sterilized either.

The TincTract® processed products possess a higher glycerol to water ratio, which is more costly, but pays off in more consistent quality, higher potency and efficacy as a result of extracted constituents and components intrinsic synergistic benefits remaining intact and biologically active.

### **TincTract® – 100% true Alcohol-Free– Unmatched Quality & Value**

TincTract® brand synchronous serialized processed 100% true alcohol-free products possess one of the highest degrees of extractive qualities derived from an all-natural glycerol solvent base there is, that also results in extracting a broad spectrum of constituents and compounds in their stabilized and synergistic biologically active state, and is non-destructive in its preservative powers, is super-absorbed into the body to a degree unmatched by alcohol, is highly nutritive, possesses important yet gentle detoxifying actions, does not trigger glycemic problems, and has a fabulous flavor enhancing quality that doesn't alter the benefits of the herbs used. TincTract® brand processed products are the most highly differentiated in the industry (*see Appendix E for detailed listing of differentiations*).

Further, the TincTract® brand process utilizes very specific and proprietary mathematical ratios, original to Mr. Robinson, for the compounding of our glycerol-extractive base and utilizes a proprietary ratio based technology in the herb-to-fluid ratios for processing these products which results in enhanced potency, consistent efficacy and high quality for these unique, innovative and well-crafted products.

Does alcohol possess ALL these qualities? Does alcohol even possess a simple majority of these qualities? Absolutely not! In fact, alcohol has none of the qualities described. Though it calls into question and challenges one of the most tenaciously held to dictum's of herbal lore, the evidence overwhelmingly shows that glycerol, when utilized and worked from a standard totally different than that for alcohol-type extractive processes, is superior to that of alcohol as an extractive agent both generally and specifically, and potentially matches alcohol in preservation if used at appropriate levels, which places TincTract® brand processed 100% 'true' alcohol-free liquid herbal products as one of just a few *premium* products available in the industry. Fact is, they're unmatched by anything else of their kind in the herbal products industry.

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## Appendix A

### Glycerin's Antiseptic and Preserving Mechanism Described.

Whereas Alcohol's antiseptic action is by way of a sterilizing and disinfecting mechanism, Glycerin's antiseptic action is by way of its hygroscopic action, which retards and arrests fermentation and mold, and by its hygroscopic action deprives pathogenic organisms of water which in turn causes dehydration and death of bacteria.

Put another way, alcohol possesses bactericidal action, whereas glycerin possesses bacteriostatic action. Though both actions are by nature antiseptic and result in death of a bacterium, the mechanisms are very different. The bactericidal action works by direct chemical killing of a pathogen, whereas the bacteriostatic action works by a process of imparting a given character to the *terrain* in which a pathogen exists thereby containing the pathogen, dehydrating it via glycerin's hygroscopic action which results in its demise.

Both have their distinct advantages, and most interestingly, also relate to the two major philosophical models of health and medical care upon which allopathic and many nature-cure sciences are based. It is imperative that these two philosophical models be understood both as to the generality and specificities inherent in the glycerin versus alcohol subject as relates to their antiseptic natures.

The two philosophical models being referred to are those of monomorphism, to which modern allopathic and drug based science owe their existence, and pleomorphism, to which traditional and herb/nature-cure sciences were based on. Whereas monomorphism is a fairly new premise that can only claim a formal existence of just over a hundred years since it was first proposed and really is still at the stage of a 'hypothetical' theory, pleomorphism is based on a premise that extends back thousands of years and is an integral part of some of the most successful and still practiced traditional medical and healing systems from around the world, many that still stand up to the test of time, scientific scrutiny and results.

Monomorphism was formerly embraced by the Pasteurian (Louis Pasteur, MD) school of thought, which basically operates on the premise that it is first a pathogenic agent that causes and renders the subject (i.e. terrain) to become diseased and therefore leaves the body's terrain in a state of crisis.

Pleomorphism was formally embraced by the Bechampian (Antoine Bechamp, MD) school of thought, which basically operates on the premise that it is first the condition of a subject's terrain (the body's tissues and fluids) that determines if a pathogen is able to take foot and have any effect and thereby increase a sub-clinical state of crisis into a clinical state of crisis by further poisoning and further toxifying the terrain.

Monomorphism typically takes the approach of direct killing a pathogenic agent with a prophylactic (active remedy). Pleomorphism takes the approach of directly affecting and changing the terrain that a pathogenic agent has gained a foothold upon, to which the terrain is so altered that the pathogen either must change its form to accompany the affected terrain, leave the terrain or be overcome by the terrain and therefore perish.

A metaphoric connection can be ascertained here regarding monomorphism vs pleomorphism, alcohol vs glycerin. Alcohol is metamorphically related to monomorphism in regards to how it deals with a pathogen or vectors of contamination and glycerin is likewise metamorphically related to pleomorphism.

With alcohol, when a pathogenic agent is directly killed or destroyed outright it produces endotoxic byproducts. Generally these endotoxins can be quite toxic when ingested, as in the case of a liquid herbal product, except that the denaturing and inert rendering action of alcohol also exerts the same actions to the endotoxic byproducts caused from alcohol's intrinsic antiseptic action on the pathogen itself.

With glycerin, when a pathogenic agent is contained as a result of the hygroscopic action of glycerin, the effect is akin to something being on a desert with the water being sapped from the body where dehydration takes place and the thing dies, but it still remains contained in its shell, having only had water escape from

it, thereby averting the endotoxic flush that happens when something is destroyed outright, and thus rendering the spent pathogen harmless.

In both cases regarding alcohol and glycerin, they each exhibit distinct antiseptic actions for stabilizing and controlling the vector of contamination that could potentially be caused by pathogens, and they each do so in their own unique and highly effective ways.

Still in doubt as to glycerin's antiseptic/preservative action? Consider the following. When a reverse osmosis cartridge is tested (as all are before being packaged for sale) it will have a residue of water left in the membrane. If this water is not treated with a safe antiseptic the contaminants in the water will culture and the resultant pathogens will destroy the membrane, not to mention the danger to human health and safety. Though much less expensive, alcohol cannot be used as the antiseptic agent for a reverse osmosis cartridge for two reasons. One, it will turn the RO membrane and rubber seals brittle in a short time, and two, it will expire from the cartridge due to alcohol's diffuse aromatic nature. Though more expensive, glycerin is used for its excellent *absolute* antiseptic action, and the fact that it has been found to keep an RO membrane pliable and within specs, while also being absolutely acceptable for human health and safety.

Any further question as to glycerin's intrinsic antiseptic and preservative actions and qualities can no longer be called into question given the above facts and numerous sources, both scientific and industry wide, supporting these facts. Fact is, glycerin is every bit as good an antiseptic and preserving agent as alcohol is (where the 'preservation' factor is concerned, better). The important thing to remember is each antiseptic's mechanisms are different, and therefore, applicable to differing applications. The key to retaining antiseptic and preserving qualities in a given application, whether alcohol or glycerin, is again, how they are used, not if one is intrinsically better than the other.

## Appendix B

### Negative Impact of Alcohol on Nutrients, Minerals and Enzymes

The following information concerning the deleterious effects of alcohol upon certain nutrients, minerals and enzymes was taken from the 'June Russell's Health Facts' web site. Please note the references. They're from government, medical, scientific and professional sources. Of special note was the fact that dry red wines appeared to be exceptions (aka the French paradox) to alcohol's deleterious effects when taken in moderation, and in fact has been shown to be quite healthy for digestive, and cardiovascular well-being. [... – LCR] are inserted comments by the Author/Compiler.

#### Effect of Alcohol on Nutrient Absorption and Mineral Depletion Generally

Alcohol interferes with the metabolism of most vitamins, and with the absorption of many nutrients. Alcohol stimulates both urinary calcium and magnesium excretion.

{Dept. of Health and Human Services, Report to Congress 1990} *[Glycerin does not. In fact, it possesses remineralizing uptake qualities, and aids in absorption of many nutrients. – LCR]*

It is best to hold off on that alcoholic drink for four hours after taking your vitamins. Alcohol may hasten a supplement's breakdown in the stomach, perhaps interfering with absorption.

{“Health Check,” by Nancy Snyderman, MD, Good Housekeeping, Jan. 1998} *[The ‘breakdown’ spoken of here deals with the dissociation and inert rendering action of alcohol on many vitamins. – LCR]*

Alcohol reduces the absorption of food through the lining of the small intestine and interferes with the absorption of amino acids, glucose, zinc and vitamins.

{“Alcohol and Tobacco, America’s Drugs of Choice.” Information Plus, 1999} *[And yet many companies who sell alcohol based liquid herbal products attempt to have the public believe the opposite. 1<sup>st</sup> year medical student knows that alcohol reduces and interferes with oral and mucosal absorption in the digestive tract. – LCR]*

Alcohol hampers the efficient metabolizing of fatty acids.

{“Get Health Now,” by Gary Null, one of America's leading health and fitness advocates, 1999}

The presence of alcohol in some beverages may lessen their health-giving properties.

{American Journal of Clinical Nutrition, 2000}

Despite an adequate diet, alcohol can contribute to the entire spectrum of liver diseases. Alcohol interferes with nutrient activation, resulting in changes in nutritional requirements.

{“Alcohol and Nutrient Interaction,” Nutrition Hints by Betty Kamen. Source - the Annual Review of Nutrition 2000} *[In fact, alcohol uses the same secondary enzyme pathway that pharmaceutical drugs do, which results in many toxic byproducts getting into the system that further compromise and damage liver tissues and function. – LCR]*

If alcohol is your soother, stress will hike your nutritional needs and alcohol will reduce nutrient availability.

{“6 Steps for Handling Stress,” Lauri Aesoph, ND, Health World Online - June 2001}

According to USDA surveys, fewer than two percent of Americans are following a diet with the recommended amounts of fruits, vegetables, and whole grains.

{Eating Right columnist Lawrence Linder, executive editor of the Tufts University Health & Nutrition Letter, Washington Post Health, October 24, 2000} *[The use of alcohol negates availability of vitamins and nutrients, so if you are already taking in fewer nutrients than you should, as 98% of the population are doing, then it is even more of a risk for resulting health problems. Why compound this problem even with small amounts of grain alcohol, as are found in alcohol based liquid herbal tinctures? – LCR]*

Food in the stomach will compete with ethanol for absorption into the blood stream. It is well known that alcohol competes and influences the processing of nutrients in the body.

{“Alcohol, Chemistry and You,” Kennesaw State University, chemcases.com - August 2002} *[And the mouth is part of the digestive system. How did the alcohol based liquid herbal tincture industry ever come up with the erroneous idea that their alcohol based products are 100% absorbed immediately? We don't think so! And neither does the scientific community at large. – LCR]*

When buying vitamins, supplements, herbs, etc., buy a reliable product. Most of the negative stories and warnings are from sub-standard products, or rare stories picked up by a pharmaceutical companies supporting media where the herbs were not taken as directed. To give you a better perspective: experts calculate that about ten million people in the U.S.

each year suffer adverse effects from prescription drugs. Sidney Wolfe, MD, a well-known consumer advocate says that one-third of conventional drugs shouldn't be used at all. Adverse drug reactions account for up to 140,000 deaths annually in the U.S. {JAMA 1997} and 25% of all surgery in the U.S. is unnecessary.

{Dr. Arnold Relman, Editor Emeritus of the Prestigious New England Journal of Medicine} *[The same can be said for the 'standardized' 'potency guaranteed' (fractionate/isolate based) phyto-pharmaceutical spiked herbal products, whether they're dried or liquid preparations! – LCR]*

### **Effect on Vitamin A Requirement**

More vitamin A is needed by those who drink alcohol because faulty liver enzymes are dissipated more quickly. Rats tested could not deal with vitamins because of the toxic by-products when combined with alcohol.

{New York Times, Oct. 20, 1985} *[Even if you disagree with linking rat research to human health, the fact remains that a rat, a pet for many people, could not process alcohol and had all these problems because they have no enzymes to metabolize alcohol, just like dogs, cats, horses, and any other animal. Pets do not have the flexibility to process alcohol of any kind! The point being that alcohol negatively affects vitamins. – LCR]*

Although five times the daily vitamin A requirement has no detectable adverse effects when given alone, when combined with alcohol there is a leakage of a cellular enzyme into the blood stream. Vitamin A supplementation then might hasten rather than alleviate the development of liver disease.

{Lieber CS. Biochemical and molecular basis of alcohol-induced injury to liver and other tissues. New England Journal of Medicine, 1988}

Recent research has found that the presence of alcohol increases the amount of vitamin A in some tissues, depletes it in others (such as the liver) and speeds up or alters the process by which the vitamin is converted into metabolic by-products. Alcohol can promote extra insulin release from the pancreas in response to glucose, causing hypoglycemia and at the same time, alcohol depletes the liver's glycogen stores and impairs its capacity for formation of new glucose.

{The Nutritional Effects of Alcohol, Mount Sinai School of Medicine Complete Book of Nutrition} *[The reason for the high hypo-glycemic index of alcohol has just been described. On the other hand, glycerin actually does the opposite of alcohol in these cases. In fact it is possible that glycerin loads up glycogen stores in the liver – a real plus in deed. – LCR]*

Alcohol interferes with zinc and vitamin A metabolism in the liver and can negatively affect night blindness.

{"Eye Signs Can Reveal Your Nutritional Health," alternativemedicine.com - June 2001}

Continued alcohol use can create changes in the digestive system which make nutrient absorption difficult. Alcohol may interfere with the body's ability to use vitamins. Breakdown of vitamin A also accelerates and may lead to vitamin A depletion in the liver. Sometimes acetaldehyde, a byproduct of alcohol oxidation, will bind with an amino acid, leading to reduced glutathione, an important substance in the liver. Glutathione helps scavenge toxic free-radicals.

{"Alcohol's Effect on the Liver," Charles Leiber, MD, Director of Alcohol Research and Treatment Center, professor of medicine and pathology, Mt. Sinai School of Medicine of the City University of New York, September 2002 - [www.health20-20.org](http://www.health20-20.org)}

### **Effect on B Vitamins**

Alcohol destroys B vitamins. This is a list of minerals and vitamins that you will need to supplement if you drink alcohol: calcium, potassium, magnesium, zinc, copper, vitamin C, thiamine and riboflavin.

{“The Complete Guide to Your Emotions and Your Health,” Editors of Prevention magazine. 1986} *[Thus, alcohol also destroys most vitamins, especially the B vitamins, in herbs that have been tinctured with alcohol. – LCR]*

You can guard against folic acid deficiency by making sure that your diet is balanced. Avoiding alcohol will lower your risk for this deficiency.

{American Medical Association, 1994}

Alcohol is known to promote folic acid deficiency, and has also been linked to an increased risk of colon cancer.

{Vitalcast.com - HealthNotes on line. Klatsky A. L., et al., "The relations of alcoholic beverage use to colon and rectal cancer," American Journal of Epidemiology, 1998} *[Unlike any alcohol based herbal tincture, an herbal glycerite can be used for enemas, and colonic irrigation purposes, with surprising benefits. – LCR]*

Even in small amounts, alcohol will destroy vitamins B12, B6, and folic acid, which causes an increase in susceptibility to homocysteine, a greater predictor of heart disease than cholesterol.

{"The Ultimate Anti-aging Program," Gary Null, 1999}

Alcohol can lower levels of both folic acid, a B vitamin that may prevent polyp formation, and methionine, an amino acid that appears to block carcinogenesis. The more you drink the higher the risk of colon cancer.  
{Self Healing newsletter, Dr. Andrew Weil, Jan. 2000}

Folic acid, a B vitamin, is important. The brains of the nuns in the study who had high levels of folic acid in their blood deteriorated more slowly. Alzheimer's is a brain-wasting disease, and the last thing you want to do is to nutritionally deprive the brain tissue. The body is rusting and you have unstable oxygen that tears down the tissues and joints, causing oxidation. Depression may make the symptoms appear earlier.  
{The Nun's Study," June 23, 2001, People's Pharmacy, Public Radio. Guest: Dr. David Snowden, author of "Aging with Grace."}

Ten to thirty percent of older people may be unable to absorb natural B12 from food.  
{“Women’s Health Advisor,” Weill Medical College of Cornell University, June 2001} *Author’s Comment* Alcohol use contributes to this depletion.

A new study in the journal *Epidemiology* reported that women whose diets were lowest in folate faced no greater cancer risk than women with higher-folate diets - if they were nondrinkers. But if they drank more than two alcoholic drinks a week, their breast cancer risk increased almost 60 percent. *JAMA* earlier reported similar findings from the Nurse's Health Study (cited as a 40% risk). It is too early to know, however, if simply getting sufficient folate is enough to prevent alcohol's damaging effects.  
{“Alcohol Worse for Some Women,” Karen Collins, R. D., msnbc.com/news - Dec. 2001}

Avoiding alcohol can minimize already depleted nutrients. Ten to 30% of older people may be unable to absorb natural B12 from food.  
{The Center for Women's Healthcare newsletter, June 2001}

A fifty percent increased risk of early miscarriage is linked to the lack of folic acid, says a Swedish-American study.  
{HealthScout.com - October 2002}

Every drink you take causes thiamine loss, impaired B6 activation, folate loss, and increased magnesium excretion.  
{from the book “Hormone Replacement Therapy: Yes or No,” by Betty Kamen - 2002}

### **Alcohol's Effect on Minerals as Coenzymes**

The use of alcohol lowers magnesium at a faster rate. Magnesium is important in over 300 enzymes in the body, and a deficiency can result in a host of problems. Blood test results can show it to be normal when levels are low. Calcium is used to make a muscle contract, while magnesium makes it relax.  
{from the book: "Tired or Toxic," by Sherry A. Rogers, an expert on chemical sensitivities, and how low levels of vitamins/nutrients can cause serious health problems, 1990} *[As stated before, alcohol denatures, renders inert and destroys just about all water soluble nutrients and active constituents that previously possessed a bio-active nature. No where is this more evident than in what it does to an herb’s water soluble and aromatic components when that herb is tinctured in a fluid base (i.e. menstrum) containing even small amounts of alcohol. – LCR]*

Even a small amount of alcohol can drain magnesium reserves.  
{from the book, "Preventing Arthritis," by Donald Lawrence, MD, PhD, specialist in the study of pain, 2000}

### **GABA**

Alcohol lowers GABA which makes it more likely that those who consume alcohol will have panic disorders. A Yale study showed that low GABA levels are linked to panic disorders. GABA is a major inhibitory neurotransmitter, a brain chemical.  
{About.com - July 2001} *[Consider the potential ‘triggering’ effect alcohol based liquid herbal tinctures have, even those that have been processed with alcohol, had the alcohol removed and replaced with glycerin. The alcoholic ‘trigger’ is still present, as many dry alcoholics will attest to. – LCR]*

Lowered inhibitions accompany low-dose use of alcohol. The neurotransmitter GABA, which serves as an inhibitor, is most affected by alcohol. For some who consume alcohol, lowered inhibition results in being heavily involved in aggression, violence and sexual assault. When GABA receptors are activated by alcohol, they change over time to become less sensitive not only to ethanol but to GABA, benzodiazepines, and other GABA agonists as well.  
{Valenzuela & Harris, 1997}; {alcoholmd.com - October 2001}

## **Aging and Alcohol**

The older population is already malabsorptive so the risk is even greater when using alcohol. As you get older, a common problem is low stomach acid and diminished secretion of digestive enzymes. Lack of hydrochloric acid and digestive enzymes can lead to malabsorption of nutrients, plus the growth of putrefactive bacteria and gas-producing yeasts in the intestinal tract.

{Richard P. Huemer, MD, "Poor Digestion in Elderly," Let's Live magazine, Nov. 1999. In 'Your Health Column.'}

## **Osteoporosis**

"For 28 million Americans (80% women), osteoporosis is a major public health threat. Ten million already have the disease and 18 million more have low bone mass. Limit alcohol because it is a risk factor. "

{National Osteoporosis Foundation, 2000}

## **Oxidative Stress**

Alcohol hastens the breakdown of the antioxidants in the blood, speeding its elimination from the body.

{CNN.com - July 2000} *[The same effect has been observed in alcohol based liquid herbal tinctures with a high ascorbic content (a water soluble component) and citric based flavanoids due to the fact that these liquid extracts darken with time as the oxidative reduction process (REDOX) ensues for both REDOX of antioxidants and many mineral components. (Often, other less antioxidant and/or mineral rich alcohol herbal tinctures lighten ('bleach') over time, not darken – in either case, indicative of REDOX or 'bleaching' of an alcohol based product.) – LCR]*

In patients who had oxidant stress from alcoholic-induced liver disease, antioxidant therapy (2,500 mg a day of vitamin C for 10 days) accounted for over a 50% decrease in stress. This would be a wise supplement for anyone drinking significant amounts of alcohol, but even wiser to avoid the alcohol.

{www.mercola.com - May 10, 2001}

The by-products of alcohol metabolism generate oxidants that can contribute to cell damage. An imbalance between oxidants and antioxidants (substances that neutralize oxidation) can create oxidative stress, a state marked by continued production of oxidizing agents and escalation of cell damage.

{Alcohol Research & Health, Vol. 25, No. 4, 2001}

## **Alcohol, Nutrients and Anti-Social Behavior**

There has been evidence dating as far back as 1942 linking nutritional deficits to antisocial behavior. A study in the British Journal of Psychology (2002) states that young adults who consume adequate amounts of essential nutrients are less likely to engage in antisocial behavior, including violence.

{ "Nutrients and antisocial behavior," Betty Kamen, PhD, and Michael Rosenbaum, MD, "Nutrition Hints," August 2002} *Author's comment:* "The use of alcohol negates needed nutrients."

## **SUMMATION**

The point of this Appendix (A) is to convey that glycerin, not alcohol, enjoys the higher station of not only being a superior and much more versatile fluid extractive solvent and true preserving agent, but is friendlier on essential water soluble and aromatic nutrients and cofactors, as well as possessing distinct tissue cleansing and building properties. Alcohol does not possess many, and often times, any of the positive qualities attributed to it. One example (of many) includes its purported immediate oral absorption, but in fact, alcohol initially inhibits oral absorption.

Among the food processing industry and a small cadre of liquid herbal producers it is now well accepted that alcohol is not capable of intrinsically removing many of an herbs active constituents to the degree previously believed and that glycerin is actually capable of doing more so, provided it is *worked* properly to do so. The key, and one that the early Eclectics missed, was 'how' a menstrum (the liquid extract medium) is 'worked,' especially in the case of glycerin. Glycerin has a much higher flash index, appears to possess a much lower oxidato-reductive (REDOX) index, has a decidedly higher colloidal enhancing index while maintaining the 'wetter-water' aspects of a solvent, and it is much more stable in maintaining the intrinsic synergistic and biologically active qualities of the varying constituents, coloring, etc., of an herbs liquid extracted parts than alcohol is intrinsically capable of doing.

Unlike the harsh chemical solvents that have come to be used extensively by the pharmaceutical industry (i.e. propane, hexane, acetone, benzene, etc.), certified Kosher USP vegetable glycerin is all natural, very nutritive and a phenomenal extractive solvent when used in the 'Think Outside The Box' way it's used in the TincTract® brand process for making totally 100% 'true' alcohol-free premium liquid herbal products. And don't forget – glycerin is safer!

## Appendix C

### **TincTract® brand process versus other glycerite processes.**

The TincTract® brand process is a unique multi-step liquid herbal processing technology conceived of by L. Carl Robinson in 1982 and in 1983 in collaboration with fellow herbalist Steven H. Horne the 1<sup>st</sup> generation TincTract® process was developed incorporating key metaphoric and applied aspects of the traditional ‘Galenic’ based 4-Fold Model for Life.

The name TincTract® is a conjunction of the words TINcture and exTRACT. The word ‘TincTract’ was originated by Mr. Robinson in 1982 and shortly thereafter its trade name use was first commercially utilized by Mr. Robinson on products made available by him to the Intermountain lay mid-wife community.

Unlike the Spagyric model (that is philosophically and application-wise ‘grain-alcohol’ based, i.e. ‘spirits’) for liquid processing herbs that utilizes a 3-fold (salt/mecurury/sulfur based) approach to its liquid extraction process, the TincTract® model utilizes a true 4-fold Air/Fire/Water/Earth based approach that is ‘glycerin’ based. There are some distinctive similarities between the TincTract® model and Spagyric model, however, the TincTract® concept is very different and much more ‘grounded’ in its philosophy and premises and possesses a more grounded both as to its theoretical and application based premises (*see Appendix D for further clarification*). That’s why though they appear similar, the two are very different when thoroughly understood as to theory, content and practice.

The genuine TincTract® brand process consist of 4 distinctive key steps rooted in modern Quantum Physics theory and the metaphoric 4-fold energetic model of life. Metaphorically speaking those steps are Earth (drying the herbs) Water (‘cold’ processing), Fire (‘dynamic’ processing) and Air (‘cleaning/finishing’ processing). Within each of these key steps are a myriad of GMP/HACCP compliant proprietary trade secreted procedures and protocols that make the commercial applications of the TincTract® brand process so extensive and effective like no other. The TincTract® brand process is now in its 6<sup>th</sup> generation of proprietary commercial enhancements and improvements that also includes unique mathematical ratios and constructs that result in very differentiated and potent finished products.

Another requisite for the TincTract® process is that it must contain a high glycerin to water ratio (which varies from herb to herb) that is intended to be an intrinsic part of the proprietary TincTract® brand processing technology itself, as well as impart a distinctive stabilizing and ‘absolute’ preserving quality unique only to TincTract® brand herbal glycerite products. The latter quality, ‘absolute’ preservation of a TincTract® brand finished product is also aimed at stabilizing (and preserving) all water soluble and aromatic constituents that are heat and alcohol/chemical solvents sensitive, as well as UV and flash heat sensitive, without the use of chemical preservatives, flash heating (pasteurization), UV sterilization, etc., resulting in a truly all-natural product throughout. Only a genuine TincTract® brand process is capable of producing all these qualities that result in superior 100% ‘true’ alcohol-free liquid herbal glycerite products that spare the ratio/synergy intact poly-constituent integrity, preserve native energetic qualities of each respective botanical, possess high potency and consistent efficacy and taste great.

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## Appendix D

### TincTract® and Spagyric Processes Compared

L. Carl Robinson, Clinical & Formulary Herbalist, the originator of and co-developer of the TincTract® process, has been asked if the TincTract® process is the same as the Spagyric process. The answer is – No! Mr. Robinson had learned of the Spagyric tradition long after he had theorized and co-elucidated the 4-fold Model for Life™ and co-developed the TincTract® process. Even though the TincTract® process appears to incorporate the conceptual principles found in the Spagyric concepts and process it goes on to involve a lot more. In other words, the TincTract® paradigm possesses within its construct distinctive 3-fold Spagyric elements and concepts but moves from there into the realm of a true 4-fold Galenic ‘Model For Life™’ paradigm - what the TincTract® method was based on in the first place.

The Spagyric philosophy and its fluid extractive method is based on the use of diatomic alcohols (grain alcohol, ethanol) as an extractive fluid medium, whereas the TincTract® philosophy and its fluid extractive method utilizes a triatomic alcohol (glycerin, glycerol). Ethanol, or what we call ‘common’ or ‘grain’ alcohol, is a diatomic alcohol. Glycerin (i.e. Glycerine, Glycerol), a common all natural, edible, nutritive compound found in all plant and animal life, is a triatomic alcohol. The difference between the two is quite profound and metaphorically speaking is akin to comparing refined white table sugar (i.e. grain alcohol) to complex polysaccharide starches (i.e. glycerin) – the former is known to imbalance and stress the body, while the latter has a tonifying, balancing and building effect on the body.

Another distinctive difference between Spagyric and TincTract® approaches is that the TincTract® processing method utilizes a unique and dynamic *serial-type* extraction approach that takes the inherent ratio-intact bio-active synergy of a plant’s constituents into account that the Spagyric process does not. Because of the lower polarity of a TincTract®’s ‘fresh’ extractive fluid base a super hungry quality exerts greater extractability force on the herb(s) being extracted. This is very different from the super saturating techniques aimed at ‘standardized’ iso-constituent potency outcomes that are typically done in the liquid herbal products industry and has made its way into Spagyric based operations.

Serial-type extractions result in surprisingly very potent and concentrated finished products. The viability of a serial-type extraction process, as opposed to super saturation processes, is well established in chemistry. Chromatography has already shown that a finished TincTract® brand processed liquid herbal product possesses amazingly high levels of active constituent/marker compounds and their broad spectrum companions, that indicates the presence of intrinsic vitamin factors and co-factors and a dense mineral content as well. It’s the broad spectrum of ratio-intact synergistic compounds present that set a TincTract® apart from a Spagyric liquid extract.

In a number of cases, TincTract® brand processed liquid herbal products have been analyzed by competitor companies attempting to ascertain the make up and nature of TincTract® processed products and indeed, the originator of the TincTract® process has been informed, often by the company itself who arranged for the analysis and testing, that these products have been found to be very high in active constituent and marker compounds and numerous nutritional factors, as well as possessing a broad spectrum of naturally occurring synergizing components only a ‘whole’ herb based product can possess. They always inquire as to how it is possible to do this with a ‘glycerite’ based process since, “This is not supposed to be able to be done with glycerine.” (Until recently, competitors doing these analysis and testing of TincTract® brand

processed products did not release the documented results to Mr. Robinson, as they informed him that the tests were intended for a the competitor company's own in-house purposes.)

Unlike any other solvent based, liquid extractive or tincturing process currently being done (including alcohol based ones), none have the intrinsic quality of removing the broad spectrum of available components in an herb like the TincTract® process does and preserving integrity of biologically active aspects at the same. This is due to two factors. First, glycerin is used (as opposed to alcohol or other chemical solvents) so as to spare poly-constituent ratios, synergy and biologically active integrity. Secondly, it's the process itself. The TincTract® process has experienced numerous generational proprietary commercial enhancements since the basic 1<sup>st</sup> generation kitchen-based process of 1983, that are all exclusive to the TincTract® brand liquid herbal products. The TincTract® brand process is now in its 6<sup>th</sup> generation of these unique and exclusive commercial improvements and enhancements, which now includes highly proprietary mathematical ratios and constructs steeped in Quantum physics that have been shown to add a unique and highly effective dimension to the process that results in a profoundly superior net quality of value wherein less actually results in more! In other words, due to the 6 generational enhancements and improvements and the unique mathematical ratios and constructs, the TincTract® process has evolved to where it has actually crossed the threshold into where the direct input of quantum physics is now a more consciously applied rule than a mere series of non-duplicable accidents or exceptions, resulting in products that rival and in many instances exceed the 'standardized' extracts industry's products.

The TincTract® brand process may well be the most *Earth-Friendly* technology in the continued sustainability of viable herbal sources today. This is due to the fact that the TincTract® brand processing technology, whose aim is to meet a high and consistent '*efficacy standard*,' utilizes much less raw botanical material than is typically used by other solvent/liquid extract based processes – in some instances up to 7 – 10 times less! What's even more surprising is that the potency and consistent efficacy is the same and often greater than that found in super-saturate 'standardized' extract products that utilize many times more raw herb to finished liquid extract than does the TincTract® process.

The *preservative* (as opposed to sterilizing/disinfecting) qualities of a TincTract® brand processed liquid herbal product are unmatched in the industry. Without altering or destroying important alcohol/chemical solvent and heat sensitive constituents or compounds and their intrinsic poly-constituent ratio/synergy aspects, which includes aromatics, enzymes and vitamin co-factors, glycerin maintains and stabilizes the bio-active qualities of these components. In fact, the originator of the TincTract® process opens up a set of original TincTract® single liquid herbs every 3 to 4 years to perform an organoleptic test and they're still as stable, full colored, flavor rich, efficacious, potent and contaminant-free as the day they were made – over 20 years ago!

In essence, a TincTract® brand processed liquid herbal product possess a potency, broad spectrum content, intact intrinsic ratio/synergy, and poly-constituent balance that is remarkably close to that of the raw herb ingredients, and is of contaminant-free purity, and of a uniquely consistent *efficacy standard* that in a quarter of a century working as an 'insider' in the herbal and health products industry the originator of the TincTract® process, Mr. Robinson, has yet to see matched by any other company's herbal products, whether liquid, dried, concentrated or 'standardized.'

# Appendix E

## Product Differentiation

### TincTract® brand Processed Products Differentiated From Other Liquid Herbal Products

There are numerous points that set the company that exclusively manufactures TincTract® brand products apart from other companies products both in the liquid herbal products industry and the herbal products industry at large. Some of those differentiating points are:

- Company that utilizes and produces TincTract® brand processed products (Cedar Bear Naturales, Inc.) is founded and owned by a ‘real’ professional Clinical & Formulary Herbalist (a member of the American Herbalists Guild) who has also been an ‘industry insider’ to the largest herbal products companies in the industry for over a quarter of a century, conceived of and co-developed the TincTract® brand technology, is a published author, and the co-developer of a successful certified applied herbal/health practitioner’s educational program practiced by thousands of clinicians and lay herbalists throughout North America, Britain, Australia and New Zealand.
- 100% ‘true’ alcohol-free (no alcohol at any time touches the products) super efficient proprietary TincTract® commercial process (even enhances and adds unique qualities to glycerin’s already versatile qualities).
- Products that taste great. (TincTract® brand formulas are the best tasting in the industry).
- Independent 3<sup>rd</sup> party lab analysis (HPCL) validating superiority of TincTract® brand process.
- Clinical trials/pilot studies verifying efficacy and consistency of TincTract® brand processed products.
- The highest quality *premium grade* herbal glycerite products available.
- All products contain FCC and USP grade ingredients.
- The company producing TincTract® products and all its products are Kosher Certified.
- All products are Halal, and Vegan compliant.
- Facility and operations FDA registered, U.S.D.A. approved, and cGMP/HACCP compliant.
- All products have zero (0) net carbohydrates and have a low glycemic index/load.
- One of a few remaining handful of herbal products companies to produce ‘whole’ herb products exclusively (as opposed to phytopharmaceutical isolate-based fractionate ingredients).
- No added chemicals or preservatives – yet needs no refrigeration!
- Clinically and multiplex developed liquid herbal formulations  
(To our knowledge, unique and exclusive to manufacturers of TincTract® brand products, and done longer in this fashion than any other individual and/or company in the industry at large).
- Products possess incredibly high synergistic bioactive nutritional density (vitamin, mineral, enzyme, cofactors and trace element rich) in their ‘whole’ poly-constituent ratio-intact biologically active synergistic state.
- Possess high potency, a consistent efficacy standard and really work, especially over long term use.  
(Stores and practitioners report that less can consistently be used than any of the competitor’s liquid products and the efficacious results continue to hold).
- Label posts 3-year shelf life – one of the longest in the industry, and needs no refrigeration!
- Incredible versatility (can be mixed with other TincTract® brand processed products and/or in juices, foods, confectionaries, etc. even enhancing the flavor of things added to).
- The original and first 100% true alcohol-free herbal formulas line for children.
- Children prefer the taste of TincTract® brand products to any others.
- Numerous practitioner based wholesale accounts that work with another competing herbal products line have told us that they’ve raised their children on TincTract® brand Children’s products exclusively because we were the only liquid product line they could find that possesses consistent efficacy and tastes good (the competing herbal products company they also represent has a liquid herbal line, but it’s not consistent in efficacy, taste’s awful, and is processed with alcohol, hence their using our products as their exclusive liquid herbal products line.). We’re not aware of any other company with this unique type of complementary relationship to another competitor’s products in the herbal products industry.
- The original and first 100% true alcohol-free herbal products line for pets. (Developed and formulated in collaboration with a licensed doctor of veterinary medicine).
- Pets prefer the taste of our products over any others.
- The original and first 100% true alcohol-free herbal products line for equine use.  
(Economical to use - recommended dosage is same as that for a large dog – not more!)
- Supported and/or endorsed by science professionals, clinicians and licensed physicians.