Bone Broth + Sambucca for Autoimmune Support in Early Stages of Viral Exposure

Watch this video

Bone Broth & Folklore Nutrition
Based on the assumption that immune system needs stimulation no matter what the condition is. Bone broth provides our bodies with bio-available (very easy to consume, digest and absorb) forms of calcium, magnesium, phosphorous and other trace minerals that are so lacking in our diets today. While we can also use vegetable-only broths to obtain certain minerals, without bones in the mix, we won’t get some of the other fantastic benefits from the gelatin and collagen they provide.

Bone Broth & Alternative Medicine (Green Allopathy)
Based on the assumption that immune system needs stimulation no matter what the condition is. Bone broths are extraordinarily rich in nutrients – particularly minerals and amino acids. Bone broths are a good source of amino acids – particularly arginine, glycine and proline. Glycine supports the body’s detoxification process and is used in the synthesis of hemoglobin, bile salts and other naturally-occurring chemicals within the body. Glycine also supports digestion and the secretion of gastric acids. Proline, especially when paired with vitamin C, supports good skin health. Bone broths are also rich in gelatin which improves collagen status, thus supporting skin health. Gelatin also supports digestive health, which is why it plays a critical role in the GAPS diet. And, lastly, if you’ve ever wondering why chicken soup is good for a cold, there’s science behind that, too. Chicken stock inhibits neutrophil migration; that is, it helps mitigate the side effects of colds, flus and upper respiratory infections.
Calcium is the raw material for bone production and fortification, and bone stock might be one of the best sources of calcium around, especially for those who avoid dairy and don’t eat enough leafy greens.

**Inhibits Neutrophil Migration**

It aids in digestion, helps with achy joints, heals the lining of your gut to help boost your immune system and prevent diseases, sickness, leaky gut, and has many other benefits.

Let’s look at it from another perspective – “inhibits neutrophil migration” – describes how the immune system is held back from responding to an infection. Yet, neutrophil migration is necessary to eliminate the infection. Another view is that anything that “inhibits” your immune system “suppresses” your immune system.

**Bone Broth & Functional Medicine**

While bone broth is an immune stimulator. Is it a good idea to stimulate the immune system with autoimmune, immune stimulated, immunosuppressed, immune-compromised or cancer patients? Granted immunosuppressed may feel better for a short time but constant provocation/stimulation of the chemokine and cytokines of **TH1, TH2 & TH17** systems can have adverse consequences. It is generally believed that immune over-activation is a major contributor to multiple organ dysfunction.

The gastrointestinal tract is an extremely effective route for the induction of both systemic and mucosal immune responses. Peritoneal exudate cells (PEC) located in the gut lining are primarily for the prevention of local or systemic disease, and serve as an immunologic barrier against a wide range of infectious agents.
Bone Broth Stimulate Cytokine & Chemokine Release

Bone broth stimulates the immune system. A breakdown shows bone broth stimulates gastrointestinal PEC to secrete cytokines interleukin (IL)-12, TNF-alpha, and IL-6. In addition, bone broth activates the secretion of chemokines KC, MIP-2, MCP-1, RANTES, and MIP-1a as well as IL-6.

**Pro-Inflammatory:** IL-12 (TH1); TNF-alpha, and IL-6 (TH17); MIP-1 (TH1 & IgG stimulant); MCP-1

**Chemokine:** KC is a potent neutrophil attractant found on endothelial surfaces. Chemokines acting on MIP-2, including IL-8, may have direct pathogenic effects in Central Nervous System diseases, independent of the induction of leukocyte migration.

**RANTES** (regulated upon activation, normal T-cell expressed and secreted): RANTES/CCL5 is released by many cell types such as platelets or smooth muscle cells and is reported in the involvement of the angiogenic process. (Cancer is angiogenic)

**Summary:** Bone broth provides concentrated nutrients and immune stimulants to the gastrointestinal tract. Making any meal with bone in the soup, stock, stew or grilling enhances the flavor. For those with a minor illness, i.e. common cold or
flu, the occasional use of broth made with bone is beneficial. For those with autoimmune conditions, concentrating bone broth will lead to further immune stimulation in an uncontrolled immune system.

- Increased calcium in the body triggers neurotransmitter release resulting in sympathetic stimulation.
- Bone broths are a good source of amino acids – particularly arginine, glycine and proline. Increased concentrations of arginine further potentiate Inducible NOS (iNOS). Arginine is associated with an increase in the release of T cells and Memory T cells.
- The cytokines stimulate the rapid mobilization of white blood cells (WBC). Within the gastrointestinal tract, chemokines leads to a significant increase of circulating WBC numbers and Memory T cell movement into the gastrointestinal tract.

Those with an autoimmune condition are unlikely to eat their way out of it. Though there is benefit to the autoimmune diet. Raw vegans exposure to lectins will have a severe detrimental stimulatory effect on the immune system. In autoimmunity, Probiotics only maintain the disease process. Autoimmunity does not discriminate and exempt the gastrointestinal from its effects. Digestion of food requires a properly functioning gastrointestinal tract capable of producing digestive chemistry in the correct amounts, sequence and order. Autoimmune conditions prevent this from occurring. Even organic food requires digestive chemistry to extract nutrition.

In Dr. Kharrazian’s latest newsletter listing the “Top 10 reasons Hashimoto’s patients don’t get well” Number 9. Taking Immune Enhancing Supplements

Nutritional supplements can either help or flare up your autoimmunity based on an individual’s T-helper dominance (whether you have a TH-1 or TH-2 dominance).

Unfortunately there is no mention of TH17 but as mentioned above Bone broth is a TH1 and TH17 stimulator.

I look at inflammation and the immune system; the way firemen look at fires. What type of fire is it – Combustible, grease, electrical, chemical? Next where is it located – crown, surface, ground? What is the immune status, TH1, TH2, and/or TH17 – stimulated, suppressed, and/or deficient of the individual, (Fig. 1). What is
the status of the gastrointestinal tract? Then develop a nutritional supplement plan to calm and restore control over the immune response. Once this is done, a person can maintain themselves through diet and lifestyle.

How Does Functional Medicine View Bone Broth?

The immune system is designed to protect the body from infection and injury, but an overactive immune response can damage organs or lead to inflammatory diseases.

The immune system is not working properly in autoimmune and many other conditions. The loss of regulatory mechanisms are the reason autoimmune conditions occur. The Immune status must be viewed in context with the NEI Supersystem cytokine, chemokine, immunoglobulins and the immune status.

Inflammation is a general term describing the effects of too many inflammatory cytokines and stimulating neurotransmitters unopposed by too few anti-inflammatory cytokines and inhibitory neurotransmitters.

When health deteriorates the immune system and the ability to produce immunoglobulins, cytokines and chemokines falters. Bacteria, parasites, and mold actively hack into the NEI Supersystem for their own benefit. In addition, many nutritional supplements or dietary habits also shift the NEI Supersystem balance, i.e. bone broth, lectins, etc. PEC responds in a similar fashion to lectins as they do to bone broth.

The cytokine, chemokines and immunoglobulins of the NEI supersystem should respond with the appropriate controlled response to the situation. Our immune system should function like a team of samurai warriors wielding a variety of different inflammatory weapons, wiping out foreign invaders with precision, accuracy, and with deadly force when necessary, but then quickly returning to a calm of an enlightened master blending into the background – unobserved and inconspicuous.

Cytokine levels differ dramatically in acute and chronic pathological conditions. In many disease states, marked local inflammatory responses cause cytokines to spill into general circulation. Changes in the circulating levels of these cytokines and chemokines have been linked to many disease states, making them valuable as
functional biomarkers. Excessive or diminished cytokine levels are associated with many clinical conditions and diseases, including:

- **Central Nervous System (Brain) Disorders** – Thyroid – Allergies
  - Autoimmunity – Cytokine Induced Sickness – Asthma
  - Endometriosis – Fibromyalgia – Toxicity – Diabetes
- **Bacterial infections** – **Viral infections** – **Parasitic infections**

The immune system is ever vigilant with responses from the sniffles of the common cold to the cytokine storm reaction to the peanut. The common thread I observe in all Folklore Nutrition, the Green Allopathy of Alternative Medicine and even the Functional Medicine practitioners is stimulation of the immune system. Some recommend doing the TH1/TH2 challenge or the elimination – provocation diet. Doing a challenge or a provocation of the immune system incurs the same risk as using a match to check for a gas leak. When the TH1/TH2 challenge was developed, TH17 was a glimmer in the distance, with only a few immunologists aware on the possible implications of a TH17 response. But TH17 is the system to watch out for. A bad experience with the **TH1/TH2 challenge** is likely TH17 dominance.

A good defense against most illness is a healthy immune system. We have been conditioned to think of external microbes as our enemy during a time of infection or inflammation. But our own immune systems are potentially more lethal. When the body detects foreign microorganisms or substances, it can respond by overprotecting the site of that irritation. In its hurry to get antibodies to the infection site, the body may dispatch so many that the level of cytokines becomes highly elevated, creating a **Cytokine Storm**.

Many take the cavalier attitude that – water will not wet them & fire will not burn them – based on their intentions that nutritional support will always do good and never do any harm.

Another thread is they treat the condition and not the person. Figure 1 is a Stimulated Cytokine test results from four **Hashimoto’s** patients. Each bar represents a different cytokine. Low levels (**Immunosuppression**) are read from top to bottom (blue). High levels (**Immunostimulation**) are read from bottom to top (red). Neutral levels are shown as white.
All have of the patients in Fig. 1 have TH17 Immune Activation. Stimulation of an already stimulated immune system does not restore health. Instead, this would induce cytokine-induce sickness behavior with frequent cytokine storms. A Cytokine storm is more of a symptomatic condition which occurs in varying forms and involves a number of different mechanisms. The primary symptoms of a cytokine storm are **extreme fatigue, low mood, anxiousness, anxiety, insomnia, high fever (intermittent hot flashes), swelling and redness, and nausea**. (You may be more familiar with a cytokine storm known as **Septic Shock**, which is another example of the immune system gone berserk.) “Storm” may be an appropriate metaphor, acknowledging a variety of mechanisms in a variety of circumstances.
After the storm is done: **Cytokine-Induce Sickness Behavior**

After the cytokine storm has subsided, sick individuals have common symptoms of sickness, **little motivation to eat, withdrawal from normal social activities, fever, burning muscles, aching joints and fatigue** and have significant changes in sleep patterns. They display an inability to experience pleasure, have **exaggerated responses to pain and brain fog**. Proinflammatory cytokines acting in the brain cause sickness behaviors. Although Functional Medicine has defined proinflammatory cytokines as the central mediators of sickness behavior, for your unique circumstances a much better understanding of how the cytokines and neurotransmitters are communicating with each other is best done through lab testing.

**How sensitive is the Immune System?**

Some individuals can have a life-threatening event simply by having a peanut touch them. Functional Medicine asks questions beyond the obvious allergic response. What must have occurred in the context of the NEI Supersystem for this to taken place? The normal checks and balances are not present in anaphylactic cases. The same could be said for those suffering from autoimmune or chronic health conditions.

**Bone Broth Provides Nutrients and Immune Stimulating Cytokines and Chemokines**

**Calcium**

When the level of calcium in the body fluids rises above normal, the nervous system is depressed and reflex activities of the central nervous system become sluggish. Also increased calcium ion concentration decreases the QT interval of the heart, and it causes constipation and lack of appetite, probably because of depressed contractility of the muscle walls of the gastrointestinal tract. Nerves rely on calcium to properly regulate the release of neurotransmitters. Increased calcium in the body triggers neurotransmitter release resulting in sympathetic stimulation.
Sympathetic stimulation causes: stimulates heartbeat, raises blood pressure, dilates the pupils, dilates the trachea and bronchi, stimulates the conversion of liver glycogen into glucose, while shunting blood away from the skin and viscera to the skeletal muscles, brain, and heart, inhibits peristalsis in the gastrointestinal (GI) tract, and inhibits contraction of the bladder and rectum.

**Symptoms of Excess Sympathetic / Deficient Parasympathetic**

* Anxiety-like response  
* Enlarged pupils  
* High blood pressure

* Infrequent bowel movements  
* Nervous strain

* Tension headaches  
* Irritability  
* Indigestion

* Rapid heartbeat with palpitations or weak pulse

* Nightmares  
* Muscle tension

**Arginine**

Bone broths are a good source of amino acids – particularly arginine, glycine and proline. Dietary supplementation with arginine can improve immune responses in various inflammatory models. However, increased concentrations of arginine further potentiate Inducible NOS (iNOS) -dependent O$_2^-$ formation in inflammatory macrophages. Arginine is associated with an increase in the release of T cells from the thymus. In addition, arginine has a direct effect on T-cell activity. Persistent inflammation and the generation of nitric oxide play key roles in tissue injury during onset of disease and as a reaction to toxicant exposures. The associated oxidative and nitrative stress promotes diverse pathologic reactions including neurodegenerative disorders, atherosclerosis, chronic inflammation, cancer, and premature labor and stillbirth. These effects occur via sustained inflammation, cellular proliferation and cytotoxicity and via induction of a proangiogenic environment. Oxidative and nitrative stress is also thought to play a role in creating the proinflammatory microenvironment associated with the aggressive phenotype of inflammatory breast cancer.
Inducible NOS is expressed following stimulation by a variety of inflammatory cytokines such as TNF-α or by lipopolysaccharide (LPS). Persistent vasodilation characteristic of cytokine storms may result from overproduction of nitric oxide. TNF-α tilts the metabolism of connective tissue fibroblasts toward proteolysis and enhances expression of iNOS, which was highly upregulated in unrestrained proinflammatory macrophages. iNOS in turn stimulates macrophage generation of NO•, which, together with O²⁻, forms ONOO• and leads to nitrative tissue damage.

Pro-inflammatory cytokines IL-1, TNF-α, IFN-γ, and IL-2 also induce iNOS. The activation of iNOS depends on the type of inflammatory response to a specific disease process. T lymphocytes depend on arginine for multiple key biological processes, including proliferation, of the T-Cell receptors responsible for recognizing antigens and the development of memory T cells. Memory T cells are characterized based on what tissues of the body they enter. The body is subdivided into different immunologic zones, and T cells that encounter antigen first in a particular tissue tend to recirculate through that tissue in the future. This tissue-specific migration is controlled by chemokines, AKA homing beacons, on the surface of memory T cells. The homing chemokines guides T cells to the tissue, and specifically to the gut. This selective recirculation allows T cells to focus their attention on sites where this antigen is most likely to be encountered in the future.

**Bone Marrow and Immune Stimulation**

Chemokines and cytokines act systemically to mobilize neutrophils. Neutrophils are the most abundant (40 to 75%) type of white blood cells. Chemokines are generated locally at sites of inflammation, and orchestrate the local recruitment of neutrophils from the blood into tissues by promoting neutrophil movement into tissues.

Mature neutrophils are present in the bone marrow where they wait to be mobilized. Upon reaching the bone marrow, chemokines in the blood stimulate neutrophil migration out of the bone marrow into the blood. The rapid mobilization of neutrophils from the bone marrow is driven by the coordinated actions of the chemokines, KC and MIP-2, and the cytokine G-CSF acting via different means.
Increased plasma concentrations of pro-inflammatory (IL-6, TNF, IL-1β, KC, MIP-2, MCP-1, have been associated with systemic inflammatory response (cytokine storms).

The chemokines KC and MIP-2 stimulate the rapid mobilization of neutrophils. Within the gastrointestinal tract, MIP-2 leads to a significant increase of circulating neutrophil numbers and neutrophil movement into the gastrointestinal tract. MIP-2 acts both systemically to increase circulating neutrophil numbers and locally to promote neutrophil recruitment into the tissue. In this regard, it is interesting that the same chemokine can stimulate mobilization and act as a homing beacon.

The chemokines MCP-1 and MCP-3 generated at sites of inflammation act to remotely mobilize leukocytes from the bone marrow. Monocyte chemoattractant protein 1 (MCP-1) is a chemokine that attracts monocytes, memory T lymphocytes, and natural killer cells. MCP-1 influences TH2 responses. MCP-1 is required for eliciting a full complement of white blood cells in a delayed hypersensitivity response. MCP-1 can attract dendritic cells.

**Bone Marrow Fatigue**

Elevated levels of specific cytokines, e.g., type I IFN, have been linked to low white blood cells, which by itself is an important predictor of poor outcomes of systemic bacterial infections. Innate immune stimulation worsens the outcome of bacterial infection by exhausting the Bone Marrow neutrophil supply. Systemic innate immune stimulation causes bone marrow neutrophil exhaustion, which negatively influences the outcome of bacterial infections. The systemic presence of bacterial compounds deriving from the infection exhaust the Bone Marrow neutrophil reservoir through a combination of increased demand and increased cell death.

**Bone Broth References**


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Mashed Malanga, Yuca, Taro with Bone Broth to fight virus

The tropical roots malanga, taro, and yuca all make excellent savory, starchy mashed potato substitutes. These are a great way to incorporate more bone broth into your diet!

Prep time: 5 minutes
Cook time: 25-35 minutes
Total time: 30-40 minutes

Ingredients

- 1 lb malanga, taro, or yuca, peeled and coarsely chopped
- 3/4 - 1 cup beef or chicken bone broth
- 2 - 4 Tbsp fat of choice (olive oil, lard, ghee, butter, palm shortening)
- salt and black pepper to taste

Cooking Directions

1. Begin by rinsing your root well under running water. Then, use a kitchen peeler to peel taro or malanga. Use a sharp knife to peel yuca. In all 3, look for any soft or discolored parts and cut those out.
2. Chop into chunks about 2" long and add to a pot filled with filtered water.
3. Bring to a boil, then cover and reduce heat to a simmer.
4. Cook for 25 minutes or until very tender and easily pierced with a fork.
5. If using yuca, remove the stringy, tough, fibrous center from each piece.
6. Strain in a colander, then add to a large bowl.
7. Mash with a potato masher. Add bone broth and oil to desired consistency (may require more or less than what is suggested here).
8. If you like, use a hand mixer to whip your mashed starch.
9. Serve immediately and enjoy!
10. You may also use any of these mashed starches as a topping for shepherd's pie.
Wheat Gluten Causes Dendritic Cell Maturation and Chemokine Secretion

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Abstract

Wheat gluten causes gut inflammation in genetically predisposed individuals. We tested the hypothesis that wheat gluten is not only a target of adaptive immunity, but also modulates the function of APC. Dendritic cells (DC) derived from the bone marrow of BALB/c mice were exposed to chymotrypsin-treated wheat gluten. This induced DC maturation as estimated by all surface markers tested (MHC class II, CD40, CD54, and CD86). The effect was dose dependent, and, at 100 µg/ml gluten matched that caused by 10 ng/ml LPS. A role of endotoxin contamination was ruled out by demonstrating the resistance of wheat gluten effects to LPS antagonist polymyxin B. DC from LPS nonresponder strain C3H/HeJ were affected by wheat gluten, but not by LPS. Proteinase K-digested wheat gluten was unable to stimulate DC maturation. Wheat gluten induced a unique secretion pattern of selected cytokines and chemokines in DC. Classic pro- or anti-inflammatory mediators were not produced, in contrast to LPS. Rather, chemokines MIP-2 and keratinocyte-derived cytokine were secreted in large amounts. We conclude that wheat gluten lowers the threshold for immune responses by causing maturation of APC, by attracting leukocytes and increasing their reactivity state. In the presence of an appropriate genetic predisposition, this is expected to increase the risk of adverse immune reactions to wheat gluten or to other Ags presented.

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