

SoyConnection

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Health & Nutrition News About Soy

DIET, SOY ISOFLAVONES AND MOOD

By Mark Messina, PhD, MS

The prevention and treatment of depression and anxiety are of increasing global importance due to the substantial health, social and economic burden they impose. Major depressive disorders and anxiety disorders are among the leading causes of "years lived with disability."¹ The global cost of these conditions in 2010 was estimated to be \$2.5 trillion.² Depression affects approximately 350 million people worldwide. In the United States, the rate of antidepressant treatment increased from 5.8% in 1996 to 10.1% in 2005 or from 13.3 to 27.0 million persons.⁴

In addition to the impact on psychosocial wellbeing, depression has serious implications for physical health. Morbidity and mortality associated with coronary heart disease and cancer are increased in individuals who also have depression.^{5,6} Although pharmacotherapy and psychotherapy are considered first-line treatments for depression, fewer than half of those treated achieve remission.⁷ Thus, there is a need to develop further treatment strategies.

Epidemiological studies have suggested that a healthy dietary pattern including fruits, vegetables, fish, olive oil, nuts and legumes is protective against depression.^{8,9} Conversely, a dietary pattern high in nutrient-poor foods may increase the risk of depression.^{9,10} Interestingly, even though there is suggestive evidence that the intake of long-chain omega-3 fatty acids, eicosapentaenoic acid and docosahexaenoic acid



is inversely associated with depression,¹¹ Beezhold et al.¹² found that vegetarian diets are associated with healthy mood states. This study found that the intake of both linoleic acid and the omega-3 essential fatty acid alpha-linolenic

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acid was associated with better mood. In addition, a pilot study found that restriction of meat, fish, and poultry in omnivores improves mood.¹³ This finding is consistent with the results of a cross-sectional study involving over 11,000 Chinese individuals which found weekly meat intake was associated with depression; however, this finding was also true for weekly bean and bean product intake.¹⁴

The connection between diet and depression may exist at least in part via the effects of diet on the microbiome. According to Dash et al.,¹⁵ “there is compelling preclinical evidence that the gut microbiota can influence behaviors of relevance to anxiety, and that manipulation of the gut microbiota with specific probiotics or with antibiotics can influence depression-like behaviors.”

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It is possible that reverse causality could underlie associations between diet and depression noted in epidemiologic studies.¹⁶ That is, a change in dietary choices could be prompted by depressive symptoms. Diminished appetite is a symptom of major depression for many and there is also evidence that some people with depression are more likely to consume high-fat and high-sugar foods¹⁷ and fewer fruits and vegetables than their non-depressed counterparts.¹⁸ However, an analysis of data from the Personality and Total Health (PATH) Through Life Study found that while current depression is associated with poorer dietary habits, a history of depression may prompt healthier dietary behaviors in the long term. Consequently, the authors of this analysis concluded that “clinicians should advocate dietary improvement for their patients with depression and should not be pessimistic about the likelihood of adherence to such recommendations.”¹⁶

Opie et al.¹⁹ recently conducted a systematic review of 17 randomized controlled trials that evaluated the effects of diet intervention on depression outcomes. Ten of these studies also reported anxiety or total mood disturbance. Almost half (47%) of the studies observed significant effects on depression scores in favor of the treatment vs. control group. The remaining studies reported a null effect. Effective dietary interventions employed a dietitian, and tended not to recommend reducing red meat, selecting leaner meat products or following a low-cholesterol diet. A limitation of this analysis is that only one trial involved participants with clinical depression.

Depression is twice as common in women as in men,^{20,21} and it has been widely suggested that women may be at increased risk of developing depression during periods of

hormonal change such as puberty, pregnancy and menopause.²² While a clear association between specific hormonal changes and depression has not been established, there is evidence from longitudinal studies suggesting that menopause is a period of risk for new onset or recurrent depression for some women.²³⁻²⁵

There is also clinical evidence in support of an effect of reproductive hormones on depression. Several (but not all) trials have found estrogen therapy, either with or without the addition of antidepressant medication, to be an effective treatment for depression in peri- and postmenopausal women.²⁶⁻²⁹ Also, research in animals has demonstrated that estradiol has a synergistic antidepressant effect when combined with anti-depressants in experimental models of

depression.³⁰ In addition, treatment with raloxifene, a selective estrogen receptor modulator, when taken along with a selective serotonin reuptake inhibitor (SSRI), induced complete remission in a postmenopausal depressive disorder.³¹ SSRIs, the most commonly prescribed antidepressants, work by blocking the reabsorption (re-uptake) of the neurotransmitter serotonin in the brain. Changing the balance of serotonin seems to boost mood by helping brain cells send and receive chemical messages.

Given the possible hormonal connection with depression, the results of a recently published study on the effects of soy isoflavones are particularly intriguing. Estrella et al.³² compared the effects of two commonly used SSRIs, fluoxetine

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(Prozac, 10mg/day) and sertraline (Zoloft, 50mg/day), with soy isoflavones (100mg/day) and with a combination of soy isoflavones (100mg/day) and sertraline (50mg/day). The participants in this three-month study were postmenopausal women between the ages of 45 and 55 who had been diagnosed with depression.

Two depression scales were used to measure efficacy: the Zung Self-Rating Depression Scale³³ (ZSDS) and the Hamilton Rating Scale for Depression (HRSD).³⁴ Assessments were conducted at enrollment and at study completion. The ZSDS is a short self-administered survey to quantify the depressed status of a patient. There are 20 items on the scale that rate affective, psychological and somatic symptoms associated with depression. The HRSD is a multiple item questionnaire used to provide an indication of depression and as a guide to evaluate recovery.

There was a statistically significant improvement in all four treatment groups in comparison to baseline ($p < 0.0001$). Importantly, the improvement in the combination group (isoflavones plus sertraline) was significantly greater than the single treatment groups when measured using the ZSDS, and was greater than the isoflavone and sertraline groups when assessed by the HRSD ($p < 0.005$). The authors concluded that soybean isoflavones “could enhance the response to SSRI antidepressants in menopausal women” and “act as an interesting alternative to estrogens in the treatment of mood disorders during menopause.” These findings are especially interesting given recent data suggesting SSRIs increase fracture risk and therefore may be a less viable long-term option for treating depression.³⁵

This trial by Estrella et al.³² is the first to be conducted with the specific goal of evaluating anti-depressant effects of isoflavones. The findings are tempered by two study design limitations. One limitation is that there were only ten women per group and a placebo group was not included due to ethical concerns. However, since the efficacy of the anti-depressants used in this study is well accepted, the lack of a placebo is of less concern. Furthermore, the combination group improved to a greater extent than the groups receiving single treatments. If the improvements were simply a placebo effect, there would be no reason for this occurrence to have been the case. The dose (100mg/day) of isoflavones used in this study is at the very high end of the dietary range; equivalent to approximately four

servings of traditional soyfoods. However, the intervention was aimed at treating an existing condition, rather than prevention, so a higher dose seems reasonable. Also, since only one dose was used, it is entirely possible that a lower dose would have been equally efficacious.

Additional support for a mental health benefit of isoflavones comes from a two-year study involving over 200 postmenopausal osteopenic Italian women that compared the effects of genistein (54mg/day), the primary soybean isoflavone, with a placebo.³⁶ Participants filled in the Short Form of 36 questions (SF-36) and the ZSDS at baseline, after one year and at the final visit. The Italian version of SF-36 is a self-administered questionnaire containing 36 items that measure the perception of health on eight dimensions: physical functioning, social functioning, role limitations because of physical problems, role limitations because of emotional problems, mental health, vitality, pain, and general health perception. The genistein group showed increases on all dimensions of the SF-36 at the end of the study which were significantly different from the placebo. Significant differences were found between the groups for the ZSDS as well, with greater improvements in the genistein group.

Finally, a recently published cross-sectional study examined the relationship between urinary phytoestrogen levels and depression among 193 perimenopausal participants of the National Health and Nutrition Survey (NHANES) 2005–2008. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9). Lower lignin, but not isoflavone concentrations were significantly associated with an increased risk of depression.³⁷ However, the value of these findings can be seriously questioned. Isoflavone intake is extremely low (<3mg/day) among participants in the NHANES.³⁸ Therefore, even if a relationship between depression and isoflavone excretion had been found, it would be very unlikely to have had a causal basis given the low intake.³⁹

In summary, there is limited but encouraging evidence that isoflavones may help to alleviate depression in peri- and postmenopausal women. The benefits of isoflavones may be similar to those reported for SSRIs. Since clinically it has been reported that antidepressants alone do not ensure success in the treatment of depressive disorders in menopausal women,⁴⁰ isoflavones may represent an important adjunct treatment for millions of women. 🍲

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MODALITIES FOR STRESS REDUCTION: WHAT WORKS?

By A. Caroline Chang, MMS, PA-C and Christine Werner, PhD, PA-C, RD

The adverse effects of stress on physical and psychological health are well established. The impact of stress on existing medical conditions, such as cardiovascular disease, cancer and pregnancy is evident in the literature.¹⁻⁴ Therapies to achieve stress reduction, which are supported by the literature, include meditation, yoga, aromatherapy, and omega-3 supplementation.

Meditative techniques and mindfulness-based interventions (MBI) are two of the most well-studied methods for stress reduction. The term meditation refers to the act of spending quiet time focusing on a particular thought, object, or sound, for the purpose of relaxation. Mindfulness focuses on being engaged in the present moment, in a nonjudgmental manner. Meditation and MBI often include yoga. Several studies have shown meditation and MBI reduce stress among healthy individuals.^{5,6} Meditation and MBI are also proving to be promising stress reduction tools for patients with various medical diagnoses, such as HIV and breast cancer.^{7,3} Chhatre et al. noted reductions in perceived stress among patients with HIV who were enrolled in a six-month mindfulness-based program.⁷ Fear of cancer recurrence concerns and depression were reduced among breast cancer survivors after only six weeks of practicing mindfulness-based stress reduction in a study by Lengacher et al.³ In addition, meditation has been shown to decrease symptoms of post-traumatic stress disorder (PTSD) in military veterans.⁸

Yoga, which has increased in popularity in the United States over the past couple of decades, has been studied for its potential for stress reduction and positive impact on disease states.

The term “yoga” in the US most often refers to the Hatha branch of yoga, which consists of physical poses encompassing sustained isometric muscle contractions and stretches, controlled breathing, and meditation. In addition to reductions in perceived stress levels in cardiac patients, yoga has been shown to reduce systolic and diastolic blood pressures and reduce the frequency of ventricular events in patients with implantable cardioverter defibrillators.^{1,2} A study by van der Kolk et al. reported decreased symptoms of PTSD in treatment-resistant patients who were enrolled in a weekly yoga program.⁹ In addition, a significant number of these patients no longer met criteria for PTSD at completion of the 10-week intervention.⁹ Although other forms of physical activity, such as walking and cycling, have been investigated for stress reduction, results are inconclusive.¹⁰⁻¹⁴ However, this is not to discredit the importance of physical activity in numerous other aspects of health.

Aromatherapy has been used for more than a century in alternative medicine practices. Certain essential oils, such as lavender, bergamot, and petitgrain, are used for their calming properties and have been studied for their effects on stress reduction. A study by Tang et al. noted reduced self-perceived stress in adults over age 76 with chronic pain when lavender and bergamot were inhaled via self-administered aromatic spray.¹⁵ Stress reduction occurred both when comparing the aromatherapy group to the control, as well as baseline to post intervention

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Healthy Handout

MENTAL HEALTH ISSUES AND FERMENTED FOODS

By Sandra Allonen, RD, MEd, LDN

The addition of fermented foods, including fermented soyfoods, may improve cognitive function for those with mental health conditions.¹ Originally developed in Asia hundreds of years ago, there are several types of fermented soyfoods. The most widely available such foods are miso, natto, soy yogurt, tamari and tempeh.

Miso is a fermented soybean paste that is used as a base for soups, spreads or sauces. Miso soup served with white rice is a traditional breakfast staple in Japan. There are 634mg of sodium in one tablespoon of miso, so use with caution if you have been advised to watch your sodium intake.

Natto is made from soybeans fermented with *Bacillus subtilis*. It also is a traditional Japanese breakfast food. It has a strong flavor and powerful smell with a “slimy” consistency. Some say it is an acquired taste. It is an excellent source of manganese and a good source of Vitamin C, Vitamin K and iron.

Soy yogurt is produced like regular dairy yogurt except that soy milk is used instead of milk. It is a wonderful option for those who are lactose intolerant or who are vegan. It can be used in numerous food preparations such as vegetable dips and fruit smoothies, or enjoyed as a snack. Nutrients, such as calcium, may vary from brand to brand, so check the label.

Tamari is a Japanese version of soy sauce. “Wheat free” tamari can be used for people with gluten intolerance. Like miso, it is high in sodium and should be used with caution if you have been advised to limit your sodium intake.

Tempeh is created in a fermentation process that binds whole soybeans into a firm cake form. Originally from Indonesia, it is a very versatile food. It can be crumbled and used as a base for chili, sliced thin and pan fried as tempeh “bacon” or grilled for a veggie burger. Its flavor has been described as meaty, nutty and mushroom like. It is also low in sodium; one cup contains 15mg of sodium. 🍌

Tempeh Chili

2 tablespoons soy oil
1 medium onion, diced
1 clove of garlic, minced
One 8-ounce package tempeh, crumbled finely
1 large red bell pepper, diced
½ cup low sodium tomato sauce
15-ounce can low sodium kidney beans, drained (or 1½ cups cooked)
15-ounce can low sodium black beans, drained (or 1½ cups cooked)
½ teaspoon cumin
2 teaspoons chili powder
¼ teaspoon crushed red pepper flakes (or more to taste)
Plain soy yogurt



Heat the olive oil in a large pot over medium heat. Add the onions and garlic, cook for 5 minutes, and then add the tempeh. Cook till the tempeh begins to brown, 5 to 8 minutes. Add the red pepper and cook until it is tender, another 5 minutes.

Add all of the remaining ingredients, along with half a cup of water. Reduce heat to a simmer and cook until the chili is fragrant, warm, and the flavors have come together (25 to 30 minutes). If the chili becomes too thick, add more water. Serve with a dollop of soy yogurt and enjoy. Serves 4–6

Calories per serving, 375 calories; total fat, 12g; sodium, 307g; total carbohydrates, 47g; protein, 22g; fiber, 16g; calcium (100g), 10% DV; iron (4g), 22% DV; Vitamin A (1,096mg), 40% DV; Vitamin C (47mg), 66% DV.

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within the aromatherapy group. Chen et al. noted that hospital nurses reported decreased stress-related symptoms when they inhaled lavender in bottles pinned to their clothing during work shifts.¹⁶ Additionally, pregnant women were noted to have decreased self-perceived stress levels after inhaling either lavender, petitgrain, or bergamot from a diffuser.¹⁷ Stress reduction in pregnancy has been found to increase the risk of preterm delivery.⁴

Omega-3 supplementation, which is well known to promote cardiovascular health, is also being studied for its potential effect on stress reduction. Examples of healthful food products that contain omega-3 fatty acids include fatty fish and non-hydrogenated soybean oil.¹⁸ Ginty and Conklin reported decreased mean arterial pressures in subjects completing a stressful task when given 1,000mg of eicosapentaenoic acid (EPA) and 400mg docosahexaenoic acid (DHA) daily as an omega-3 supplement, compared to placebo.¹⁹ Also, in a randomized controlled trial, reduced cortisol and perceived stress levels were noted in patients with a history of alcoholism who were administered 60mg/day of EPA and 252mg/day of DHA.²⁰ Like aromatherapy, daily supplementation of an omega-3 supplement consisting of 450mg of DHA, 90mg of EPA, and 40mg of docosapentaeonic acid and eicosatetranoic acid decreased perceived stress levels in pregnant women.²¹ In

addition, the omega-3 supplementation group also had lower levels of cortisol in the third trimester of pregnancy.²¹

In summary, of the many potentially efficacious stress reduction therapies, meditative techniques, yoga, aromatherapy, and omega-3 supplementation are most promising. These interventions can be affordable, time efficient, and relatively safe. The implementation of these stress reduction therapies should be considered in traditional medicine, with each plan individualized for the patient. 🍲

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