Community Garden

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Community Garden

• “Any piece of land gardened by a group of people.” (1)

• Bentonville City has planned a community garden on N.E. J street adjacent to the Crystal Bridges museum.

• Construction starts in June 09 on the park and the garden will follow along with the landscaping.

• Their goal is to practice organic principles of gardening.

http://urbangardencasual.com/tag/community-garden/
Orchards Park Conceptual Design

Proposed Community Garden Location
• We contacted Bentonville City and gathered information on the planned community garden.

• Our aim is to educate the public with brochures and/or posters on the health benefits of growing one’s own vegetables, and at the same time promote the community garden.

• Our focus was to name some vegetables easily grown in this area, and identify the phytochemicals and health benefits of consuming these vegetables.

• Community gardening benefits:
  – Physical health
  – Mental attitude
  – Family economics
  – Environmental

http://www.dreamstime.com/fresh-vegetables-image3141830
Health Benefits of Community Gardening

• American Community Garden Association states:

• Gardens:
  – Improve the quality of life for people by:
    • Improves diet.
      – Lowers risks of disease related to malnutrition.
      – Produces nutrient dense foods.
    • Creates opportunity for recreation, exercise, therapy and education.
      – Exercise boosts the immune system and gives one an overall happy outlook.

http://urbangardencasual.com
Mental Benefits of Community Gardening

• Reduces Stress.
• Stimulates social interaction.
  – Lowers risk of depression.
• Encourages self-reliance.
• Creates a feeling of self-worth.

www.princeton.edu
Socio-Economic Benefits of Gardening

- A few vegetables can put a meal on the table.
- Reduces family food budget.
  - A $1.00 packet of seeds can produce $60.00 worth of vegetables.

http://www.dreamstime.com/fresh-vegetables-image3141830
Economic Development

Creates income opportunities:
- Excess produce can be sold at the local farmers market.
- Excess produce can be swapped with fellow gardeners.

Environmental Benefits

• Conserves resources.
• Beautifies neighborhood.
• Preserves green space.
• Creates jobs.
• Reduces crime.
• Increased sense of community.
• Encourages cross-cultural connections.

http://urbangardencasual.com
What are Phytochemicals?

• Phytochemicals are non-nutritive plant chemicals that interact with nutrients and dietary fiber, and as a result have protective or disease preventive properties.

• Phytochemicals are found in a wide variety of plants. Plants developed phytochemicals as a means of defense against highly reactive oxygen molecules.
What are Phytochemicals?

• Thousands of phytochemicals have been identified over the last several decades of research.

• A single fruit or vegetable can contain many phytochemicals. An orange, for example, contains more than 170 phytochemicals.

• Research over the last several decades have revealed that phytochemicals not only serve as a defense for the plants that produce them, but can also serve as a defense for the humans and animals that consume them.
Dietary Sources of Phytochemicals?

- Fruits and Vegetables
- Whole Grains
- Legumes
- Herbs
- Nuts
- Wine
- Tea and Coffee
Health Benefits

- Cancer Prevention.
- Heart Disease Prevention.
- Stroke Prevention.
- Blood Pressure Benefits.
- Vision Health.
- Bone-Health.
- Lung Function.
- Gastrointestinal Health.

www.cenblog.org
Health Benefits

- Urinary Health.
- Antioxidant Effects.
- Immune System Stimulation.
- Anti-Aging Effects.
- Hormone Regulation.
- Enzyme Stimulation.
- Anti-Bacterial Effects.
- Anti-Viral Effects.
- And Many More…

www.smma59.wordpress.com
Fruits and Vegetables

• The best dietary sources for phytochemicals are fruits and vegetables.

• Some phytochemicals influence the color of the plant they are in.

• Thus, fruits and vegetables can be organized by color, which can help to identify their corresponding phytochemicals and their health benefits.
Colors of Health

- Fruits and vegetables can be organized into five color categories:
  - Orange and Yellow
  - Green
  - Blue and Purple
  - Red
  - White

www.fotosearch.com
Orange and Yellow

• Contain zeaxanthin, lycopene, limonene, tangeritin, hesperidin, terpenes, and beta-cryptoxanthin.
• Benefits for age-related eye problems, prostate cancer, heart disease, blood pressure, digestion, collagen formation, bones and joints, cholesterol, immune system, and fight harmful free radicals. Reduce risk for some cancers.

www.greenbmun57.wordpress.com
Carrots

Alpha and Beta Carotene

– Pro-vitamin A -
– is converted to Vitamin A in the liver by oxidation.

– Sources
  • Pumpkin
  • Winter squash
  • Carrots
  • Green vegetables

http://www.elmhurst.edu/%7Echm/vchembook/532vitaminA.html
• Alpha & Beta Carotene


• Essential for normal growth and development.
• Immune system function.
• Vision.
• Help slow the aging process – dementia.
• Reduce risk of certain types of cancer.
• Decrease risks of heart disease and stroke.
Corn

PhytoSterols

- Phytosterols compete with dietary cholesterol for uptake in the intestines.
- They have the ability to block the uptake of cholesterol (to which they are structurally related) and facilitate its excretion from the body.
- Cholesterol is a significant risk factor in cardiovascular disease.
- Appear to alter cell membrane transfer in tumor growth and reduce inflammation.

- Source: Found in most plants. Rice, bran, and corn are excellent sources.

http://www.forbesmedi.com/s/Phytosterols.asp
Citrus Fruits

- Limonene: $\text{C}_{10}\text{H}_{16}$
- Methyl-4-isopropenyl cyclohexene.
- Is an enantiomer, a mirror image of each other.

- Have an anti-cancer effect.
- Increases levels of liver enzymes involved in detoxifying carcinogens.
- Protects lungs.

http://waynesword.palomar.edu/chemid1.h
Green

- Contain zeaxanthin, lutein, sulphoraphane, glucosinolates, zeaxanthin, indoles, quercetins, isothiocyanates, beta-carotene, and carbinol.

- Beneficial for blood pressure, lung function, cholesterol, immune system, diabetes, allergies, digestion, and eye health. Fight free-radicals and reduce some cancer risks.
Nutritional Greens

- Are super potent antioxidants.
- Rich in chlorophyll which:
  - Purifies the blood.
  - Detoxifies and rejuvenates the body.
  - Protects against pollutants and radiation damage.
  - Have anti-inflammatory and anti-viral properties.

http://feedingkids.wordpress.com/
Cabbage

**Sulforaphanes:**

- May reduce risk of colon cancer.
- Sulforaphanes have powerful anti-bacterial effects against H. pylori infection, which is known to cause peptic ulcers and stomach cancer.

**Sources:**
- Broccoli
- Brussel sprouts
- Collard greens

https://www.beaumonthospitals.com/health-library/P01275
• Quercetins:
  • Reduce inflammation associated with allergies, asthma, and hay fever
  • Protect the lungs from harmful effects of pollutants and cigarette smoke.
  • Protect L.D.L. cholesterol.
Leafy Greens

Lutein and Zeaxanthin are known as Xanthophylls.

- Animals cannot produce xanthophylls, but they are necessary in the diet.
- Function as antioxidants
- Found in the eye.
- Give the green color to leaves and plants.

- Helps maintain proper vision in ageing.
- Reduces risk of
  - Cataracts,
  - Macular degeneration.
- May help reduce risk for certain cancers.

- Found in
  - Kale, spinach, collard greens.
  - Broccoli, kiwifruit and brussel sprouts.
  - Romaine lettuce.
Spinach

- **Zeaxanthin:**
  - Protect eyes from light-induced oxidative damage.
  - Only carotenoid in the human lens.
  - May prevent or slow progression of cataracts.
  - 20-50% less likely to have cataract extraction with high intake level.

- Sources: Broccoli, kale, Spinach.
Blue and Purple

- Contain lutein, zeaxanthin, resveratrol, ellagic acid, anthocyanins, phenolics, and quercetin.
- Benefits for the eyes, cholesterol, heart, immune system, digestion, urinary tract, memory, calcium absorption, inflammation, and colon cancer. Reduce tumor growth and suppress cancer cells. Anti-Aging properties.

www.worldofstock.com
Blueberries

• Contain anthocyanins and phenolics.

• Powerful anti-oxidant properties, reduce cancer risk, decrease cholesterol, slow brain-aging, and improve memory.
Eggplant

- Contain nasunin and chlorogenic acid.

Plums

• Contain neochlorogenic and chlorogenic acid.

• Increase iron absorption and protect cells. Macular degeneration prevention. Aid in digestive health and are a strong antioxidant.
Red

• Contain lycopene, phytoene, phytofluene, ellagic acid, quercetins, resveratrol, hesperidin, and anthocyanins.

• Benefits for the heart, memory, urinary tract. Act as antioxidants and reduce cancer risk, especially prostrate cancer.
Tomatoes

- Contain lycopene.

- Benefits liver health, skin health, heart disease, cholesterol, and can help prevent a wide variety of cancers.
Strawberries

• Contain anthocyanins and ellagic acid.

• Antioxidant. Reduced risk of heart disease and some cancers. Improved eye health. Tumor suppression.
Beets

- Contain high levels of beta-carotene.
- Benefits cholesterol, blood pressure, blood and artery health, eye and skin health, immune system function, and can decrease risks of certain cancers.

http://www.ydzx.com

www.worldcommunitycoookbook.org
White

- Contain allyl sulfides, allium compounds, sulphoraphane, zeaxanthin, allicin, selenium, indoles, anthoxanthins, quercetins,

- Benefit heart health, cholesterol, and blood pressure. Reduce risk of stomach and colon cancer and heart disease.
White

-Allium Compounds (Allyl Methyl Trisulfide)

• Garlic, Onions and Scallions
• Lower cholesterol levels.
• Lower blood pressure.
• Can prevent bacteria from converting nitrates into carcinogenic substances.
White

Indole (Indole-3-carbinol)
• Cauliflower and turnips.
• Reduces the risk of certain types of cancer.
• Has enzymes that can metabolize carcinogens.
• Enhances DNA repair.
Completed Project

We designed a brochure for the future Bentonville Community Garden that provides basic background information about phytochemicals. The brochure lists the six categories of color for vegetables and fruits, and outlines some of the health benefits associated with consuming each color category. We are providing samples of the brochure to the Community Garden, as well as the master copy. They will have the option to distribute it as they wish.
“What are Phytochemicals?”

Phytochemicals are non-nutritive plant chemicals that interact with nutrients and dietary fiber. As a result of this interaction, they have protective or disease preventive properties.

Thousands of phytochemicals have been identified over the last several decades. A single fruit or vegetable can contain many beneficial phytochemicals. For example, an orange contains over 170!

Phytochemicals were developed by plants as a means of defense against highly reactive oxygen chemicals. Research has revealed that phytochemicals not only serve as a defense for the plants that produce them, but can also serve as a defense for the people that consume them.

Dietary sources of phytochemicals include fresh fruit and vegetables, whole grains, legumes, herbs, nuts, “tea, coffee, and wine.

For more information on the community garden;

Contact:
Community Development Building
305 SW A St.
Bentonville, AR
72712

Phone:
479.271.3126
479.271.3122

Fax:
479.271.5906

http://www.unclewireys.com
http://www.healthydiningfinder.com
http://www.doh.wa.gov
Phytochemicals act like vitamins and are found in fruit and vegetables. Listed are the health benefits to eating a colorful fresh diet. Eat 5-9 servings a day for maximum benefit.

**GREENS:**
- Lower risk of some cancers and detoxify undesirable compounds.
- Promote strong bones and teeth.
- Maintain good vision health.
- Help protect against breast and prostate cancer.
- Promote healthy skin.
- Arthritis prevention.
- Protect against H. Pylori, a cause of stomach ulcers.

**ORANGES:**
- Promote heart health.
- Improve vision health.
- Lower risk of some cancers.
- Boost immune system to promote good health.
- Slow ageing.
- Boost antioxidant activity, reducing damage to cells.

**REDS:**
- Reduce risk of lung disease and asthma.
- Improve blood vessel health.
- Have anti-inflammatory properties.
- Have anti-allergenic effects.
- Protect against urinary tract infections.

**WHITES:**
- Promote a healthy heart.
- Help lower cholesterol and blood pressure.
- Increase the body’s ability to fight infection.

**YELLOWs:**
- Strengthen bones and teeth.
- Speed the healing of wounds.
- Promote healthy skin.
- Reduce risk of heart attack.

**BLUES/PURPLES:**
- Are antioxidants.
- Have anti-ageing properties.
- Improve memory function.
- Protect against some cancers.
- Promote urinary tract health.
NWACC Website Link

• https://mail.nwacc.edu/exchweb/bin/redir.asp?URL=http://faculty.nwacc.edu/EAST_original/Spring%25202009%2520Projects/Organic%2520Physiological%2520Chemistry%2520spring%25202009/Organic%2520Physiological%2520Chemistry/Phytoc hemicals.htm
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9. www.molecularexpressions.com
10. www.ag.ndsu.edu
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