

## Some Like It Spicy!

### Cayenne: Its Health Benefits

- The chemical formula for capsaicin is  $C_{18}H_{27}NO_3$ .
- It is a lipid soluble compound.\*
- Capsaicin from chili peppers binds to a channel protein in specialized sensory nerve pain receptors.
- These nociceptors respond to painful mechanical, chemical, and thermal stimuli.
- The perception of heat is measured in SHU- Scoville Heat Units.

### THE HOTTEST PEPPER IN THE WORLD: TRINIDAD MORUGA SCORPION

#### SCOVILLE HEAT UNITS (SHU)

This "superhot" hit an average of more than 1.2 million Scoville heat units, making it many thousand times hotter than the jalapeño, which hits about 5,000 units.

Scoville heat units (SHU) measure the amount of spicy heat in chili peppers based on the amount of capsaicin, a compound that makes the peppers, well, hot.

Just one drop of pure capsaicin in 100,000 drops of water would be enough to blister your skin. In fact, capsaicin is so hot that researchers who handle it need to wear protective clothing and gloves, and work in a specially filtered room.

### Comparing Chili Varieties and Their SHU

SCOVILLE heat UNITS	CHILI VARIETIES	SCOVILLE heat UNITS	CHILI VARIETIES
<b>1.5 - 2 MILLION</b>	Moruga Scorpion	<b>5,000 - 15,000</b>	Jalapeño, Serrano
<b>100,000 - 500,000</b>	Habanero, Scotch Bonnet, African Bird's Eye	<b>2,500 - 5,000</b>	Mirasol, Louisiana hot sauce
<b>50,000 - 100,000</b>	Chinese <i>kwangsi</i>	<b>1,000 - 1,5000</b>	Old Bay Seasoning
<b>30,000 - 50,000</b>	Tabasco, Long Cayenne, Thai <i>prik khee nu</i> , Pakistan <i>dundicut</i>	<b>0</b>	Bell, Pimiento, Sweet Banana, US Paprika

## **HEALTH BENEFITS OF CAYENNE:**

### **CARDIOVASCULAR BENEFITS**

- Red chili peppers, such as cayenne, have been shown to reduce blood cholesterol, triglyceride levels, and platelet aggregation, while increasing the body's ability to dissolve fibrin, a substance integral to the formation of blood clots.\*\*
- Chili peppers may also protect the fats in your blood from damage by free radicals - a first step in the development of atherosclerosis.\*\*
- In men, the chili-diet also lowered resting heart rate and increased the amount of blood reaching the heart.

### **LOWER RISK OF TYPE 2 DIABETES**

- Australian researchers showed that the amount of insulin required to lower blood sugar after a meal is reduced if the meal contains chili pepper. When chili-containing meals are a regular part of the diet, insulin requirements drop even lower.
- Chili's good effects on insulin needs get better as body mass index (BMI, a measure of obesity) increases. Chili in meals of overweight people not only significantly lowers the amount of insulin required to lower blood sugar levels after a meal, but chili-containing meals result in a lower ratio of C-peptide/ insulin, indicating that the liver is clearing insulin faster.\*\*\*
- Chili's antioxidants (vit. C/carotenoids) help improve insulin regulation.

### **PROSTATE CANCER PREVENTION**

- Prostate cancer is the most common cancer in men in the United States with more than 230,000 new cases reported each year, according to "Cancer Research."
- The anticancer property is not because of the high SHU but because of the flavonoids which scavenge free radicals in our system, and free radicals are known to cause cancer.

### **HELP STOP THE SPREAD OF PROSTATE CANCER**

Capsaicin stops the spread of prostate cancer cells through a variety of mechanisms:

1. Capsaicin triggers suicide in both primary types of prostate cancer cell lines, those whose growth is stimulated by male hormones and those not affected by them.
2. Capsaicin lessens the expression of prostate-specific antigen (PSA),
  - It inhibits the ability of the most potent form of testosterone, dihydrotestosterone, to activate PSA, and directly inhibits PSA transcription, causing PSA levels to plummet.
3. Capsaicin may also help reduce the expression of proteins that control growth genes that cause malignant cells to grow.

The dose effective for test animals was equivalent to 400 milligrams of capsaicin, three times a week, for a man weighing about 200 pounds. After four weeks of receiving capsaicin, prostate cancer tumor growth and size decreased significantly in the animals.

**One warning:** Excessive intake of hot chilies has been linked to stomach cancer, so don't go overboard.

### **PAIN-RELIEVING PEPPERS (MUSCULOSKELETAL)**

- “It is the endorphin rush that makes capsaicin an effective remedy for pain. The endorphins work to block the heat. The body produces them in response to the heat, which it senses as pain.” New Mexico State University's Chile Pepper Institute.
- Capsaicin can be used topically and ingested. Topical ointments and creams containing capsaicin are helpful in relieving pain from many different conditions, including arthritis, fibromyalgia, nerve pain and lower back pain.
- While capsaicin is not a cure for pain caused by these conditions, it does lower the amount of substance P, a chemical that helps transmit pain signals to the brain, when applied directly to the skin. University of Maryland Medical Center

### **PAIN RELIEF FOR PSORIASIS**

- In a double-blind placebo controlled trial, nearly 200 patients with psoriasis were given topical preparations containing either capsaicin or placebo.
- Patients who were given capsaicin reported significant improvement based on a severity score which traced symptoms\* associated with psoriasis.
- The side effect reported with topical capsaicin cream is a burning sensation at the area of application.
- Capsaicin is a potent inhibitor of substance P, a neuropeptide associated with inflammatory processes.

### **CLEAR NASAL CONGESTION**

- Capsaicin not only reduces pain, but its peppery heat also stimulates secretions that help clear mucus from your stuffed up nose or congested lungs.

### **EAR INFECTION**

- According to the University of Maryland Medical Center, capsaicin, provided it's in an extremely diluted form, can also be used to treat ear infections.

### **BOOSTS IMMUNITY**

- The bright color of red chili peppers signals its high content of beta-carotene or pro-vitamin A.
- Just two teaspoons of red chili peppers provide about 6% of the daily value for vitamin C coupled with more than 10% of the daily value for vitamin A.

- Often called the anti-infection vitamin, vitamin A is essential for healthy mucous membranes, which line the nasal passages, lungs, intestinal tract and urinary tract and serve as the body's first line of defense against invading pathogens.

### **PREVENT STOMACH ULCERS**

- Chili peppers have a bad—and mistaken—reputation for contributing to stomach ulcers. Not only do they not cause ulcers, they can help prevent them by killing bacteria you may have ingested, while stimulating the cells lining the stomach to secrete protective buffering juices.

### **CAPSAICIN and GENE INVOLVEMENT FOR REDUCED CALORIE INTAKE**

- Physiology of brown adipose tissue (BAT) vs. white adipose tissue (WAT)
- Capsaicin intake results:
  - better blood markers
  - gene expressed inclination to BAT than to WAT
  - Hypothalamus gave more satiety signals
  - Better gut bacteria

### **WEIGHT LOSS**

- All that heat you feel after eating hot chili peppers takes energy—and calories to produce.
- Even sweet red peppers have been found to contain substances that significantly increase thermogenesis (heat production) and oxygen consumption for more than 20 minutes after they are eaten.

### **A WORD OF CAUTION**

- Always talk to your doctor before using capsaicin or any other herbal treatment. Some people experience heartburn or stomach irritation when taking capsaicin supplements or eating hot peppers.
- Test topical ointments containing capsaicin on a small area of skin to check for irritation, and don't use it with a heating pad or apply it immediately after a hot shower.

### **WARNING!**

Not all capsaicin containing chilis are equal! Hot peppers are part of the Dirty Dozen Plus.

**AS USUAL- DISCLAIMER:** This presentation is for educational purposes. It is not to take the place of medical consultation for diagnosis and management.

Thank You!