





More on salt and cooking

lons from salt help to keep proteins in solution as they denature and bind proteins together before forming a curd

When baking bread, the salt ions disrupt the like charges of gluten proteins allowing the proteins to come closer together forming a better cross-linked network.
Salt is said to "toughen gluten". By allowing the proteins to form networks even a weaker flour (low gluten flour or a dilute bread mixture) can still form better dough.

•High amounts of salt in the dough will limit the yeast fermentation resulting in less gas and a more dense bread.

Salt in water can increase the boiling point of water and decrease the melting point of ice. These are examples of colligative properties

Salt ions allow volatile compounds to escape from the liquid phase while cooking into the gas phase where these compounds can be smelled and tasted.





Alaea Hawaiian Sea Salt includes bits of lava and coral particles making the red, brown or pink color.



Herbs vs Spices

- Herps and plants (and salt) are seasoning
- Herbs and Spices are products of plants
- Herbs are the leafy material of a plant
- Spices are made from the other parts of the plant (root, stem, bark...)



Herbs and Spices

Much of the flavor and aroma are due to small organic "volatile" compounds Compounds with a high vapor pressure Or These molecules easily escape from the food or drin















Pungent Alkaloids are a second class of pungent herbs and spices and are natural products that contain one or more basic nitrogen atoms (think pH). They often are derived from phenols. Examples include black peppers (chavicine and piperine) hot pepper (capsaicin) N 0 Piperine Capsai (Chile Pe Piperine and Chavicine are both found in Piper nigrum (black pepper plant) both compounds bind to pain receptor TRV1 found in most cells. - Piperine is more stable than chavicine along with other terpines and why we find a difference in "bite" between fresh cracked pepper and aged crushed pepper. White pepper is made from the same berry as black pepper, but the cover of the fruit is removed by bacterial decomposition in water. This is where most of the aromatic terpenes are located but the piperine and chavicine remain in the heart of the berry. White pepper has the heat but less of the aroma of black pepper Hot peppers produce *capsaicin* (more later) also bind to the pain receptor.



























Lets put this together...

There are a couple of different lines of reasoning for the natural role of capsaicin– no one really knows for certain, that is why it is science and not fact...

Chemical Deterrent –

- fruits with seeds are mostly protected by shells or not harmed as they pass through the gut.





Don't Bug Me

Capsaicin- found in the placenta (ribs) of the fruit. •Different chilies have more or less capsaicin in the placenta

•Larger fruit has less capsaicin •High temp and drought increases capsaicin content





Don't Bug Me

Fungus (*fusarium*) invades, uses the fruit to grow causing damage to chili peppers.

- · Fungus gains entry after bugs damage skin
- Capsaicin doesn't alter the number of "bug bites" but did limit the fungal infection by half
- The more capsaicin the less fungal growth and more the seeds were spread





Hot Sauce is "swell"

Long term exposure of capsaicin to nociceptor leads to loss of chemical signal and ability of nerve to respond to pain signal

- Topical (salve rub) exposure or injection of capsaicin leads to "desensitization" of pain
- This blocks sensation of pain and inflammation and swelling that comes with some chronic injuries.
- Being used as a patch for arthritis and other pain causing disorders



Does size matter?

No strong relationship between size of the pepper or color of the pepper... BUT...

- Capsaicin increases right before maturation.
- Colors of peppers change at the same time.





So the overall color from Green to Red is less important than the color of a specific pepper. The smaller peppers are typically (but not totally) the hottest



The Science of Cooking	350,000-577,000	Red Savina Habanero
	100,000-350,000	Habanero Chile [10]
	100,000-350,000	Scotch Bonnet [10]
	100,000-200,000	Jamaican Hot Pepper ^[5]
	50,000-100,000	Thai Pepper, Malagueta Pepper, Chiltepin Pepper
	30,000-50,000	Cayenne Pepper, Ají pepper [10], Tabasco pepper
	10,000-23,000	Serrano Pepper
	7,000-8,000	Tabasco Sauce (Habanero)[11]
	5,000-10,000	Wax Pepper
	2,500-8,000	Jalapeño Pepper
	2,500-5,000	Tabasco Sauce (Tabasco pepper) [11]
	1,500-2,500	Rocotillo Pepper

hottest with 1,000,000 SHU. Pepper spray is around 5,300,000









still be sent even with cold nerve activation





Louisiana-Style Hot Sauce

Ingredients

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The Science of Cooking

- 5 Red Cayenne or 8 Serrano peppers 4 Jalapeno peppers
- 1 cup distilled white wine vinegar
- 1/2 medium tomato (optional) 1 tsp salt

1 tsp sait 1 tsp sugar

Directions

Blanch peppers (boil 1 cup distilled white vinegar and drop peppers for 2-3 min). Add peppers, salt and sugar with $\frac{1}{2}$ cup of vinegar to blender. Blend until smooth. Add rest of vinegar and blend until smooth.



Directions

Blanch **deseaded** peppers (boil 1 cup vinegar and drop peppers for 2-3 min). Add peppers, salt and sugar with ½ cup of Tequila to blender. Blend until smooth. Add rest of vinegar and blend until smooth. Fine strain filter and pulp – return some if needed



