



PEPPERS

A Photographic Guide by Daniel Beim



Introduction

Peppers: Culinary proof that humans are a terrifying species that loves to defy natural selection and push the boundaries of their stomachs and of nature. A perfect example of this is the fact that someone saw the Carolina Reaper – the current hottest pepper in the world – and thought it would be a good idea to add some of it to a beer, ignoring the fact that anything but milk spreads the burn of capsaicin. It never ceases to amaze me, and though I don't quite have the stomach for it, I can't say that I blame people for eating them. For the unaccustomed it's all about the thrill, and thanks to one too many days spent browsing YouTube, I can certainly say that watching people try to explain things after chomping a pepper is disturbingly entertaining.

More important than the entertainment factor though is the fact that peppers are very aesthetically pleasing vegetables; Edward Weston's *Pepper No. 30* would not have been such a hit if they were boring, right? With this in mind, I set out to get my hands on a variety of peppers to see how each type looked both inside and out. Thanks to the wonderful vendors at the City of Rochester Public Market, I was able to gain samples ranging from sweet Bell Peppers, all the way up to the dreaded Bhut jolokia (or Ghost pepper) and give them a little studio time to take a look under their skins.



How to Measure Pepper Heat

Peppers and products with their derivatives typically have their heat measured in "Scoville Heat Units (SHU)" using the "Scoville scale," developed by Wilber L. Scoville in 1912. The scale was developed by diluting the chosen pepper's extract until a panel of testers could no longer sense the "heat", thus calculating a measurement of the concentration of capsaicin – the chemical compound that causes the "heat" associated with peppers – within the pepper. One "Scoville Heat Unit" is equal to one part sugar water needed to dilute the capsaicin. Under this system sweet peppers that have no heat have a rating of zero units, whereas extremely hot peppers like the Carolina Reaper can reach ratings of up to 1.6 million units. Due to its reliance on human subjects to determine the ratings, the system is imperfect and typically provides a range of values within a single species. Most species will also naturally vary in heat based on their growing conditions, how they are stored, and how they are prepared, so determining a single measurement is difficult regardless of measurement system. Nowadays there are more accurate ways to record heat levels by measuring the level of capsaicin instead of relying on a psychometric system, but for most consumers the large numbers established by Scoville's system are perfectly acceptable.

Bell Pepper

Bell peppers are native to Mexico, Central America and northern South America and are members of the *Capsicum annuum* species of peppers. They are the only variety of pepper that does not produce capsaicin, ridding them of the "hot" sensation typically associated with peppers. They come in a variety of colors with the most common being red, green, yellow, and orange.



Poblano peppers originated in Puebla, Mexico and are members of the *Capsicum annuum* species of peppers. Poblano peppers have a thick green skin and have a low heat rating ranging from 1,000-2,000 SHU. They are a common ingredient in southwestern cooking, sometimes being stuffed or roasted.

Poblano Pepper

Jalapeño Pepper

Jalapeño peppers originated in Mexico and are members of the *Capsicum annuum* species of peppers. They have a variable mild to hot heat rating ranging from 2,500-10,000 SHU depending on growing conditions and preparation. They are commonly eaten when still green, but will turn red when fully ripened like the one on this page.



Cayenne peppers – AKA red hot chili peppers or Guinea spice – supposedly originated in Cayenne, the capital of French Guiana, which gave it its namesake. They are members of the *Capsicum frutescens* species of pepper, with a high heat rating ranging from 30,000-50,000 SHU. The peppers are traditionally dried and ground into a powder to create red pepper spice to add flavor to a meal.

Cayenne Pepper

Thai Chili

Unlike the other peppers present in this publication, the Thai chili is not one specific pepper, but rather a category of around 79 different ones. All varieties are part of the *Capsicum annuum* species of peppers and have a very high heat rating, but those rating range anywhere from 50,000 SHU up to 225,000 SHU depending on the specific variety. They are typically used in Southeast Asian curries and other dishes to add heat and flavor, either in chopped or powdered form.



Habanero peppers originated in the Amazon and are members of the *Capsicum chinense* species of peppers. They have a thin skin and a very high heat rating varying between 100,000-350,000 SHU. Habaneros come in a variety of colors like the orange seen here, as well as red and yellow. It also has several spicier variants such as the Chocolate Habanero (300,000-577,000 SHU).

Habanero Pepper

Scotch Bonnet

Scotch Bonnet peppers originated in the Caribbean and are members of the *Capsicum chinense* species of peppers. Similar to Habanero peppers, Scotch Bonnets have a thin skin and a very high heat rating varying between 100,000-350,000 SHU. The difference between the two lies in the sweeter flavor and more portly form of the Scotch Bonnet. Scotch Bonnets come in a variety of colors and sizes, as seen below.



Bhut Jolokia – AKA Ghost peppers – are cultivated in the Nagaland and Assam regions of India as well as in Bangladesh, and are a hybrid of the *Capsicum chinense* and *Capsicum frutescens* species of peppers. Ghost peppers are extremely hot, with Scoville ratings ranging from 800,000 to over 1 million SHU. They are used as a spice or sometimes a food like any other pepper, but are also known to be employed as a form of defense either by smearing the juices on something like a fence or in pepper spray.

Ghost Pepper

Photographic Procedure

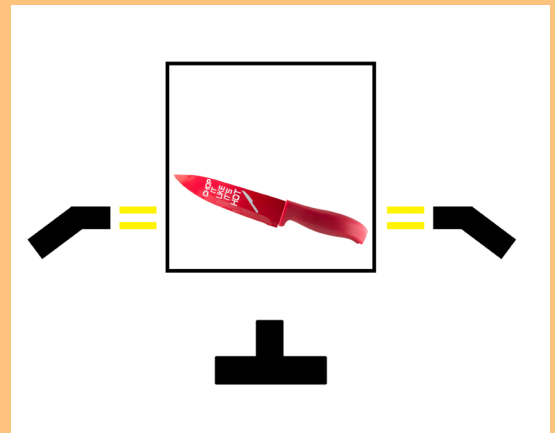
Equipment:

- Nikon D800 + 105mm f/2.8 macro lens
- 2x Nikon Speedlight SB-910
- Canon EOS 5D Mk. III + EF 100mm f/2.8 macro lens
- 2x Canon Speedlite 580EX II
- 2x Pocket Wizard receivers + 1x Pocket Wizard transmitter

Setup:

In order to photograph my peppers I created my own lightbox and set it up on a table with two flash units, one for each side, as well as a light going through the top of the lightbox for focusing. I photographed each pepper externally first at an in-camera magnification of $\sim 1:3$, then carefully cut the pepper in half and got internal close-ups at a magnification between $1:3$ and $1:1$ depending on the pepper size and how deep it was.

The images of the Bell, Cayenne, Thai, Habanero, Scotch Bonnet, and Ghost peppers were taken with the Nikon D800. The images of the Poblano and Jalapeño peppers were taken with the Canon 5D Mk. III.



About the Author



Daniel Beim is a fourth year Biomedical Photography student at the Rochester Institute of Technology. While photographing for this project, he took one bite of a Habanero pepper and thought his mouth was on fire for almost an hour despite having two pints of milk. He vowed to never make that mistake again, but will probably continue to randomly eat other spicy foods to keep his sinuses and stomach on their toes.

When Daniel is not making questionable culinary choices he enjoys reading, biking, and exploring forests and other serene environments with or without his camera. Upon graduation he plans to pursue a career as an ophthalmic photographer, possibly with some surgical photography on the side.

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