

Engineering a Better Beef Broth

Can any manufacturer produce a broth that truly tastes like beef—not just salt or vegetables—if its starting point is a bare minimum of meat?

BY TAIZETH SIERRA

Our first experience sampling beef broths in 1998 left an unpleasant taste in our mouths, and from then on we avoided it whenever possible. The U.S. Department of Agriculture requires a ratio of 135 parts water to only 1 part beef in broth or stock (the government doesn't distinguish between the two), and it was clear these products literally lacked beef. Then when we revisited the topic eight years later, there was progress; two brands that we sampled actually had beefy savor. But as we researched where this amped-up beefiness was coming from, it turned out it wasn't from a cow. It was from a lab. Advances in food chemistry had yielded big improvements, making the newer broths more palatable. Since then the USDA requirements haven't changed, but food chemistry has continued moving forward. Ever hopeful that we'd find an even closer stand-in for homemade, we decided to take another look. We sampled 13 brands (six stocks, five broths, and two reconstituted bases), with the top eight contenders graduating from the plain tasting to rounds in which we used them in French onion soup and gravy.

Making Progress

After crunching the numbers from this latest tasting, it was clear that most of the broths still tasted dreadful—"like the foam and crud you might skim off a pot of stock," according to one taster—but that two manufacturers had actually raised the bar. While no one would ever confuse these newcomers with homemade, they trounced our previous winners from 2006, Redi-Base Beef Base and Pacific Beef Broth. In particular, batches of onion soup made with the two new winners both received votes as the beefiest of the bunch, with "rich," "savory," "roasty, clean, well-developed meat flavor" and "thick, gelatin-like" body.

We were certainly relieved to have better options on the market. But what exactly was the source of this new beefed-up flavor? We scanned the labels of these two top broths, figuring that we'd see a lot of overlap, given that they were nose to nose in the final ranking. To our surprise, one brand listed nearly 20 ingredients—many of them processed additives—while the other listed fewer than 10. According to the labels, the former stock also boasted a total of 7 grams of protein per serving (the highest in the lineup), while the latter had just 3. (Most of the other brands, however, had 2 grams or less.) How could two broths with quite different protein counts

still share such a similarly beefy flavor—and accomplish it in seemingly very different ways?

The answer, we found out, all depends on how you define "protein."

Label Sleuthing

We looked again at the longer label of College Inn Bold Stock Tender Beef Flavor. Its top ingredient was beef stock—which, with 135 parts water to 1 part meat (known in the industry as the moisture-protein ratio, or MPR), we knew didn't account for much flavor. In fact, that equation translates to less than 1 ounce of beef for each gallon of water. When we make beef stock in the test kitchen, we load up the pot with the equivalent of 12 pounds of meat per gallon of water.

But the next item on the list seemed far more promising: beef extract. We learned that this term, also regulated by the USDA, refers to a mixture made from boiling consecutive batches of meat in the same cooking liquid until it boasts 75 percent "solids" to 25 percent "moisture." It was anyone's guess how much of this potent brew was actually included in the College Inn stock (and the company wouldn't tell us), but this one additive alone could account for most of the broth's total protein count and a lot of its flavor. We put aside any disappointment that the meat typically used to make beef extract is itself highly processed: corned beef or corned beef byproducts.

Two more processed-beef derivatives on the label caught our attention: beef powder (defined by the USDA as "dried pulverized beef tissue") and beef fat (a "beef byproduct"). Though the powder in particular sounded pretty far removed from a cow, it turns out both additives can have a significant impact on meaty flavor. Each contains two naturally occurring flavor-amplifying compounds: glutamates (the most common form of which is monosodium glutamate, or MSG) and nucleotides. Neither glutamates nor nucleotides exhibit much taste on their own, but together they can boost savory, *umami*-like flavors by 20-fold.

But glutamates aren't just found in meat. Other foods, from Parmesan cheese to mushrooms, are also rich in these umami-boosting compounds. The College Inn stock contained two such ingredients: tomato paste and yeast extract. Yeast extract especially is packed with glutamates and nucleotides. In broth it functions like salt but without straight-up salty flavor and is such a powerful flavor "potentiator," it could be no coincidence that the

manufacturers of our five highest-ranked broths all seasoned their products with it.

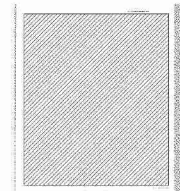
Through the use of processed-beef products and glutamate-rich additives, College Inn had clearly figured out a low-cost formula for boosting beefy flavor. But with so little real meat as its starting point, it still needed the help of corn syrup solids, soy lecithin, and gum arabic to create the body that in a homemade stock comes from the breakdown of meat's collagen. Were factory-engineered flavor and consistency really the best we could do?

The Natural Choice

Our other favorite broth was Rachael Ray Stock-in-a-Box All-Natural Beef Flavored Stock (made by Colavita), one of the more expensive broths in our lineup at \$4.95 per 32-ounce container. This stock had the same beefy profile as College Inn—in fact, some tasters even lauded its flavor as "steaky"—but a much shorter roster of ingredients. In this case, the biggest clue to its taste was at the very top of the ingredient list: "concentrated beef stock." Skeptical at first that this term was anything more than an appealing-sounding description, we went back to the USDA and discovered a crucial piece of information: To be labeled "concentrated," beef stock must have a minimum moisture-protein ratio of 67:1—roughly double the concentration of regular stock. And just as in regular stock, that protein must come from raw, unprocessed meat. That meant that the primary ingredient in the Rachael Ray stock started with twice as much fresh, uncooked meat as that in the other stocks, including College Inn. Even better, this stock contained no processed additives except for yeast extract yet still managed to taste really beefy.

As we've said in previous broth tastings, what's on store shelves is far from perfect. The USDA requires only a bare minimum of raw, unprocessed meat, so most companies have no incentive to literally beef up their broth. However, these two are the closest approximation of the real thing we've found; both will ramp up meaty flavor in any soup, gravy, or stew. But since the Rachael Ray broth manages to do so almost exclusively with the same natural ingredients you'd put in your own stockpot, given the choice, that's what we'll be buying to stock our own pantry.

Note: Coincidentally, College Inn tweaked its formula just as we went to press, but with minimal consequence. Tasters found the new formulation as beefy as the old one, and it also came in neck and neck with the Rachael Ray stock.



TASTING BEEF BROTH

Twenty-one *Cook's Illustrated* staff members tasted 13 beef broths, stocks, and bases identified as top-selling national brands by Chicago, Ill.-based market research firm SymphonyIRI Group, rating them on beef flavor, aroma, saltiness, and overall appeal. The top eight brands were tasted again in gravy and French onion soup. Scores were averaged, and broths appear in order of preference. We eliminated the following brands: Imagine Organic Beef Flavored Broth, Kitchen Basics Beef Stock, Health Valley Fat-Free Beef Broth, More Than Gourmet Glace de Veau Gold, and More Than Gourmet Beef Style Culinary Stock.

RECOMMENDED

RACHAEL RAY Stock-in-a-Box All-Natural Beef Flavored Stock (made by Colavita)

Price: \$4.95 for 32 oz.

Sodium: 480mg per cup

Protein: 3g per cup

Ingredients: Concentrated beef stock (contains: beef stock, sea salt, yeast extract), vegetable stock (carrot, celery, onion, leek, natural flavor)

Comments: "Steaky" with "thick, gelatin-like body," this was the only product to achieve reasonably beefy flavor in soup and gravy without a slew of processed additives. Its primary ingredient—concentrated beef stock—contains twice as much meat as regular beef stock and is amplified by only one additive: glutamate-boosting yeast extract.



COLLEGE INN Bold Stock Tender Beef Flavor

Price: \$3.99 for 32 oz.

Sodium: 730mg per cup

Protein: 7g per cup

Ingredients: Beef stock, beef extract, contains less than 1% of the following: natural flavors, vegetable juices, salt, sugar, tomato paste, yeast extract, dextrose, corn syrup solids, beef powder, beef fat, potassium chloride, mono- and disodium phosphate, soy lecithin, gum arabic, caramel color, thiamine hydrochloride

Comments: Singled out for its "strong aroma of roasted bones" and fairly "robust" flavor, this broth—full of beef derivatives and flavor-boosting additives—tasted "nicely beefy" and "well balanced" in onion soup, though some tasters noted that it became "very salty" when reduced in gravy.



RECOMMENDED WITH RESERVATIONS

SWANSON Cooking Stock, Beef

Price: \$2.99 for 26 oz.

Sodium: 500mg per cup

Protein: 4g per cup

Ingredients: Beef stock, contains less than 2% of the following: yeast extract, sea salt, natural flavoring, honey, salt, onion juice concentrate, tomato paste, beef fat, carrots, cabbage, beef extract, onions, celery, celery leaves, parsley

Comments: Though this broth scored high in the gravy test with "decent beef flavor," tasters detected slightly "sour" and "bit-ter" flavors in the plain tasting as well as in the soup. Tasters also deemed the broth to have hints of "chicken stock," concurring that its meaty flavor wasn't distinctly beefy.



PROGRESSO 100% Natural Beef Broth Flavored

Price: \$3.69 for 32 oz.

Sodium: 850mg per cup

Protein: 1g per cup

Ingredients: Water, beef broth, sea salt, autolyzed yeast extract, sugar, natural flavor, salt, evaporated cane juice, beef tallow, spices, onion powder, beef, garlic powder, gelatin

Comments: More than 25 adjectives were used to describe this high-salt broth (several of them favorable); however, "beefy" was used sparingly. (No surprise since water is the first ingredient.) Cane juice brought out the caramelized onions' sugar, rendering the French onion soup "sweet and bland."



RECOMMENDED WITH RESERVATIONS (CONTINUED)

REDI-BASE Beef Base

Price: \$7.95 for 8 oz. (makes 2½ gallons)

Sodium: 690mg per cup

Protein: 1g per cup

Ingredients: Roasted beef with natural juices, salt, yeast extract (contains salt, caramel color, and barley gluten), sugar, beef extract, onion powder, caramel color, rendered beef fat, potato flour, chicken fat, flavors, maltodextrin, natural flavors (contains soy-bean), disodium inosinate, sodium guanylate

Comments: In 2006, this brand topped our ranking, our only complaint being that many tasters found the gravy salty. This time around tasters found it had comparatively faint meaty flavor, despite its top ingredient being roasted beef.



NOT RECOMMENDED

WOLFGANG PUCK Organic Beef Flavored Broth

Price: \$3.42 for 32 oz.

Sodium: 660mg per cup

Protein: 1g per cup

Ingredients: Organic beef broth [water, beef broth, maltodextrin, pureed vegetables (carrot, celery, onion), salt, cane juice solids, natural flavor, caramel color, soybean oil, potato starch, vegetable flavor (celeric concentrate), tomato paste]

Comments: "Sweet," "mild," "boring." This brand steered clear of yeast extract and all other flavor potentiators except for tomato paste. The upshot was a watery broth, lacking in character and flavor.



IMAGINE Organic Beef Flavored Cooking Stock

Price: \$3.87 for 32 oz.

Sodium: 630mg per cup

Protein: 2g per cup

Ingredients: Filtered water, organic beef extract, organic beef flavor, sea salt, organic evaporated cane juice, natural flavors

Comments: Tasted plain, this broth was described as "sweet," "vegetal," and "sugary"—and things didn't improve in onion soup or gravy. Without yeast extract, this stock fell short on beefy flavor.



PACIFIC Organic Beef Broth

Price: \$3.99 for 32 oz.

Sodium: 570mg per cup

Protein: 2g per cup

Ingredients: Organic beef stock (water, organic beef stock concentrate), organic beef flavor base (organic roasted beef including beef juices, organic cane juice, organic beef flavor, organic onion powder, sea salt, organic canola oil, caramel color, organic garlic powder, organic black pepper, organic paprika, flavor), sea salt, organic beef extract, autolyzed yeast extract, organic garlic powder

Comments: Recommended in our last tasting, Pacific was comparatively "vegetal" this time, possibly because the autolyzed yeast extract is listed second to last, indicating a very slight presence.



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