

Contents

ACKNOWLEDGMENTS	ix	Umami as a global presence 36
PROLOGUE: HOW IT ALL BEGAN	xiii	Umami has won acceptance as a distinct taste 38
		And umami is still controversial ... 39
WHAT EXACTLY IS TASTE, AND WHY IS IT IMPORTANT?	1	1 + 1 = 8: GUSTATORY SYNERGY 41
The basic tastes: From seven to four to five and possibly many more 1		Amazing interplay: Basal and synergistic umami 41
Why do we need to be able to taste our food? 4		Detecting umami synergy on the tongue and in the brain 42
There is more to it: Sensory science, taste, smell, aroma, flavor, mouthfeel, texture, and chemesthesis 5		Japanese dashi: <i>The</i> textbook example of umami synergy 43
Is there a taste map of the tongue? 7		The art of making Japanese dashi 45
Why are some foods more palatable than others? 8		Nordic dashi 47
A few words about proteins, amino acids, nucleotides, nucleic acids, and enzymes 9		Dashi closer to home—a Japanese soup with a Scandinavian twist 48
Glutamic acid, glutamate, and the glutamate ion 11		Seaweeds enhance the umami in fish 52
Glutamic acid and glutamate in our food 12		How to make smoked shrimp heads 53
How does glutamate taste, and how little is required for us to taste it? 13		Many substances interact synergistically with umami 54
THE FIRST FOUR:		A breakthrough discovery of yet another synergistic substance 54
SOUR, SWEET, SALTY, AND BITTER	15	The interplay between glutamate and the four classic tastes 55
The physiology and biochemistry of taste 15		A simple taste test: Umami vs. salt 56
The interplay between sweet and bitter 16		Umami-rich ‘foie gras from the sea’ 57
Taste receptors: This is how they work 17		Food pairing and umami 60
When words fail us: Descriptions of tastes 20		Creating tastes synthetically 60
		Umami: Either as little or as much as you like 62
THE FIFTH TASTE: WHAT IS UMAMI?	23	UMAMI FROM THE OCEANS: SEaweEDS, FISH, AND SHELLFISH 65
Science, soup, and the search for the fifth taste 23		Seaweeds and konbu: <i>The</i> mother lode of umami 65
Glutamic acid and glutamate 24		A world of konbu in Japan 66
What is the meaning of the word <i>umami</i> ? 26		Fresh fish and shellfish 69
From laboratory to mass production 27		Cooked fish and shellfish dishes and soups 69
How MSG is made 28		Umami and the art of killing a fish 72
A little letter with a huge impact:		A traditional clambake:
The ‘Chinese restaurant syndrome’ 32		New England method, Danish ingredients 74
The Japanese discover other umami substances 34		Everyday umami in ancient Greece and Rome 79
It all starts with mother’s milk 35		

Fish sauces and fish pastes	81		
Modern <i>garum</i>	85		
Shellfish paste	87		
Oyster sauce	87		
Sushi and fermented fish	88		
<i>Katsubushi</i>	90		
Catching <i>katsuo</i> to optimize umami	91		
<i>Niboshi</i>	91		
The hardest foodstuff in the world	92		
<i>Kusaya</i>	96		
Nordic variations: Horrible smells and heavenly tastes	96		
Fish roe	98		
Seven friends, <i>The Compleat Angler</i> , and a pike	100		
UMAMI FROM THE LAND: FUNGI AND PLANTS		105	
Umami from the plant kingdom	105		
Dried fungi	110		
Fermented soybeans	111		
Soy sauce	112		
Production of <i>shōyu</i>	113		
Miso	114		
Production of miso	114		
The Asian answer to cheese: Fermented soybean cakes	118		
<i>Nattō</i>	120		
Black garlic	122		
<i>Shōjin ryōri</i> : An old tradition with a modern presence	122		
The enlightened kitchen	124		
Tomatoes	126		
Green tea	134		
UMAMI FROM LAND ANIMALS: MEAT, EGGS, AND DAIRY PRODUCTS		137	
The animal kingdom delivers umami in spades	137		
<i>Homo sapiens</i> is a cook	140		
Preserving meats in the traditional ways	142		
Air-dried hams	143		
Salted beef: Pastrami and corned beef	144		
Bacon and sausages	145		
Dairy products	146		
Blue cheeses	146		
Aged, dried, and hard cheeses	148		
Eggs and mayonnaise	151		
Harry's crême from Harry's Bar	151		
UMAMI: THE SECRET BEHIND THE HUMBLE SOUP STOCK			155
Soup is umami	155		
Osmazome and <i>The Physiology of Taste</i>	158		
Amino acids in soup stocks	160		
A real find: A dashi bar	160		
The taste of a beef stock	162		
Ready-made umami	164		
Knorr and Maggi: European umami pioneers	165		
MAKING THE MOST OF UMAMI			167
MSG as a food additive	167		
Other commercial sources of umami	168		
Hydrolyzed protein	169		
Umami in a jar	170		
Yeast extract	172		
Nutritional yeast	172		
More sources of umami for vegans	173		
Ketchup	174		
<i>Bagna càuda</i>	175		
Worcestershire sauce	176		
Umami in a tube	177		
Twelve easy ways to add umami	178		
Quintessentially Danish: Brown gravy, <i>medisterpølse</i> , and beef patties	180		
Slow cooking: The secret of more umami	182		
Ratatouille and <i>brandade</i>	190		
This is why fast food tastes so good	191		
Green salads and raw vegetables	194		
Umami in dishes made with small fowl	196		
Cooked potatoes: Nothing could be simpler	197		
Rice and sake	197		
Beer	200		
Umami in sweets	202		
<i>Mirin</i> is a sweet rice wine with umami	203		

UMAMI AND WELLNESS	207	Umami synergy 220	
Umami and MSG: Food without ‘chemicals’	207	The taste of amino acids	222
Umami satisfies the appetite	209	Taste thresholds for umami	223
Why does umami make us feel full?		Content of glutamate and 5'-ribonucleotides	
The ‘brain’ in the stomach	209	in different foods	223
Umami for a sick and aging population	210		
Umami for life	211		
		BIBLIOGRAPHY	233
		ILLUSTRATION CREDITS	237
EPILOGUE: UMAMI HAS COME TO STAY	213	GLOSSARY	239
		INDEX	255
		THE PEOPLE BEHIND THE BOOK	264
TECHNICAL AND SCIENTIFIC DETAILS	217		
Umami and the first glutamate receptor	217		
Yet another receptor for umami	218		

RECIPES

Potato water dashi with smoked shrimp heads	53	Parmesan biscuits with bacon and yeast flakes	150
Monkfish liver au gratin with crabmeat and vegetables	58	Harry’s crème	152
Pearled spelt, beets, and lobster	70	Chicken bouillon	157
Crab soup	76	Green pea soup with scallops and seaweed	163
Clambake in a pot	78	Dressing with nutritional yeast	173
<i>Patina de pisciculis</i>	82	Eggplant gratinée with garlic, anchovies, and nutritional yeast	174
<i>Garum</i>	86	Oysters au gratin with a crust of nutritional yeast and smoked shrimp head powder	175
Quick-and-easy <i>garum</i>	86	<i>Bagna càuda</i>	176
Smoked quick-and-easy <i>garum</i>	87	Old-fashioned Danish <i>medisterpølse</i>	181
Seriously old-fashioned sourdough rye bread	107	Beef patties, Danish style	183
Anchovies, grilled onions, sourdough bread, <i>pata negra</i> ham, and mushrooms	108	Chicken Marengo	185
Deep-fried eggplants with miso (<i>nasu dengaku</i>)	115	Cassoulet	186
White asparagus in miso with oysters, cucumber oil, and small fish	116	Beef <i>estofado</i>	188
Grilled <i>shōjin kabayaki</i> : ‘fried eel’ made from lotus root	123	Sicilian ratatouille	190
Baked monkfish liver with raspberries and peanuts	128	<i>Brandade</i> with air-dried ham and green peas	191
Slow-roasted sauce with tomatoes, root vegetables, and herbs	130	Three-day pizza with umami—not really a ‘fast food’	192
Fried mullet with baked grape tomatoes, marinated sago pearls, and black garlic	132	Quail pâté	196
Mushrooms, foie gras, and mushroom essence	138	Risotto	197
		Oxtails braised in wheat beer	201
		Umami sorbet with <i>maccha</i> and tomato	202
		White chocolate cream, black sesame seeds, Roquefort, and brioche with nutritional yeast	203