Maggie Beidelman
Documentary Script: “The Trouble with Bread”
TRT: 26:30

Begin music. Bread-making montage: milling seed, turning dough, bread coming out of oven, alternately in factory, at a small bakery, and in a backyard. Title card: “The Trouble with Bread.” *End music.*

Ken Albala: [vo] People have been eating bread for **[on camera]** 10,000 years as the staple, as a cornerstone of every single meal.

Black & white video - slicing bread, child eating bread, man eating bread.

Archive VO: Bread is the foundation of our daily meals. It’s the number one food on the tables of people all over the world. For very good reason. It’s the most economical source...

Narrator: I grew up eating sandwiches, pizza, toast, all kinds of bread. And I had no problem eating it.

Archive VO: It is wholesome, tasty, and although man doth not live by bread alone, without it, a meal seems incomplete.

Michael Pollan: Calories from wheat makes up about a ⅕ of our diet. It’s not all in bread, I mean wheat is in pastries and snacks and it’s an additive in lots of food. But it’s a ⅕, it’s 20%, it’s a big player.

Still photo of Maggie.

Narrator: But for me something changed. This is me three years ago, back when I *was* able to eat bread. *These days*, whenever I eat wheat, I feel sick.

Tracking shot of cart down aisle at grocery store.

Narrator: Until recently, the idea of not being able to eat bread was crazy. But the wheat products you find in today’s grocery stores, are more difficult to digest, and it’s all thanks to this thing called gluten.

Drawing animation of chemical structure of gluten protein.

Michael Pollan: Gluten is essentially these two kinds of proteins, gliadin and glutenin, that when wet, combine to form a mesh. That mesh has certain qualities that are remarkable. Chief among them, the fact that it holds air. It forms little pockets, balloons that get bigger and bigger and bigger because gluten is very stretchy. And so it makes really good bread.

Shot of breadmaking through large window. Shot of busy city street from above. Shot of Port of San Francisco sign from across water. Shot of man walking down San Francisco street.

Narrator: But when I eat bread, it feels like a hangover -- I get a stomachache, nausea, exhaustion, it's like my body is trying to fight off the bread. Since I live in the breadbasket of America, I decided this was the best place to look for answers. And so I got started.

Begin music. Gluten & Allergen Free Expo tent. People walking in crowded room with booths.

Saleswoman 1: [on cam] Our cake mixes are a combination of tapioca, potato and rice flour.

Saleswoman 2: [on cam] This won our national Sophie award. So for 2012, best snack food in the organic, gluten free product line.

End music.

Albala: [vo] It seems strange to me that wheat has gone through, very recently, **[on cam]** a real fear of it -- not just for calories, but for, um, intolerance -- gluten intolerance has become this enormous obsession.

Saleswoman 3 points to her food products. Saleswoman 4 points at man, her assistant flips bread buns on a fake grill.

Killilea: [vo] Gluten-free advertisements on a product is one of the most effective ways to sell a product, apparently.

Pollan: When we say gluten-free, that connotes, healthy in the grocery store. But it is not necessarily the case, because there's a lot of really cruddy gluten free products.

Saleswoman 4: [on cam] Do you want some bread?

Narrator: The place was packed, and the food was terrible -- all these snacks were way too sugary and I ended up with a stomachache.

Woman points to recipe in magazine.

Saleswoman 5: [on cam] This one's gluten-free, soy-free, vegetarian.

Saleswoman 4 offers bread to little girl, who takes it. Grandmother pats little girl on head.

MP: Is everyone complaining of gluten intolerance really having a physiological reaction to it? I kind of doubt it. I mean, there are people who really struggle with this, and I don't want to suggest it's all in their heads. It's not. (But it could all be in my head?) It could all be in your head, yes. (laughs) It's a possibility.

Pan of "Wheat Belly" book and table of snacks at expo. Kids run around expo with bags of samples. Artistic rendering of intestinal villi.

Narrator: Okay great, so I could be imagining this whole gluten intolerance thing. But there's another possibility. What if I have celiac disease?

MP: Celiac disease is an autoimmune disease in which the lining of the intestine, the villi, begin attacking themselves. And people uh, lose the ability to absorb nutrients, and essentially, starve.

Killilea: One in 130 people or so is thought to be at risk for celiac disease. That's huge, one out of 130 is incredible.

Begin music. Still photos of Maggie getting blood test.

Narrator: So I decided to get tested for celiac. Celiac disease is four times more common than it was in the 1950s. But allergies have increased, too. So maybe gluten intolerance is part of a bigger story, about how our immune systems just don't work like they used to.

End music. Scenic shots of San Francisco at sunrise.

Voicemail: [vo] Hi Maggie, this is Lynn Anne Jacob. I'm a nurse at the Tang Center with Vicki Sommer. You had some tests done on the 25th and you called for the results, and they're both negative.

Narrator: So I didn't have celiac. Which means I probably have this kind of gluten intolerance that nobody really understands. Apparently, my gut gets inflamed when I eat gluten, which causes my stomachaches, headaches and other delightful symptoms. A friend suggested that if I wanted to find a real wheat bread I could eat, maybe I should start at the beginning.

Begin music. Albala lights outdoor clay oven.

Albala: [vo] There are a lot of just-so stories about the origin of bread. It's not like there's **[on cam]** an ah-hah moment, where everyone's eating flatbread and suddenly it poofs up and someone says, ah I have risen bread. There's a long spectrum of degrees until you get to a really poof loaf like we have.

Albala puts bread into oven. Archive still images of ancient Egyptians and Sumerians with bread/wheat. Albala takes bread out of oven, cuts slice of loaf. *End music.*

Albala: [vo] The first bread is from the Sumerians in what is now Iraq, probably around 10,000 years ago. The Egyptians and Sumerians are definitely the first because wheat is indigenous to the Middle East. In the wild state, the ancestors of wheat, **[on cam]** monococcus, was one grain per stalk. So, you know, we have twenty, thirty now.

Albala eats slice of bread.

Narrator: One grain to thirty per stalk is a big change. I wanted to see it for myself.

Archive video clip of grains of wheat, a man taking a drink, and farmland.

Archive VO: Wheat. And to grow the wheat it takes a farmer. From New York to Michigan to Nebraska to Oregon and from the Dakotas down through all the great grain belt, 1,000, 10,000 and 100,000 wheat farmers grow the finest of wheat.

Title Card: “The Farm.” Foothills with field in foreground. A handful of seeds run through someone’s fingers. Wheat combine harvests in field.

Oppenheimer: [vo] In this country, almost all bread is made from this hard red winter wheat. **[on cam]** There’s some indication, some anecdotal indication, that there’s a link **[vo]** between these this hard wheat and people’s gluten problems. But that could well be circumstantial.

Man drives tractor across field. Shot from behind tractor as it drives down row. Sheep stand in field. Still photo of heritage wheats.

Pollan: There’s more gluten in wheat now than there used to be. We breed specifically for gluten.

Narrator: Bakers prefer wheat with more gluten because it’s easier to bake with. I didn’t know if more gluten meant more stomachaches, but maybe I could eat bread made from older, heritage wheats that have less gluten.

Planting tractor turns around and goes down next row. Still photo of green heritage wheats. Seed fills tractor.

Oppenheimer: The main reason that we don’t grow much variety and that we’ve gotten to a state of monoculture in this country is is has everything to do with yield. The old heritage wheats, the yields are just lower.

Rominger: [on cam] A lot of these heritage varieties are old. You know, maybe you have a disease problem, maybe they grow tall and fall down. Maybe they thrash out in the wind. **[vo]** It’s just obviously more complicated. It’s a premium product. It’s a **[on cam]** specialty product. You know, it’s like a $100 bottle of wine or something.

Sunburst over field. Tractor gets filled again with seed from afar, at sunset. Closeup footage of wheat stalks in field.

Narrator: A $100 bottle of wine. I could see that heritage wheats were too expensive, and that I was pretty much stuck with hard red winter wheat. I started to think, maybe it wasn't the plant itself, but the way we process it that's changed.

Closeup of stone hand quern. Albala fills quern with seed and grinds the wheat into flour.

Albala: [on cam] This is a hand quern. It's pretty much the same technology as you'd find in 10,000 B.C. The only difference is that I have a plastic knob on mine, but otherwise it's the same. So when I turn it, it just crushes the grain. This turns around. As you can see, the wheat will come out right about there. See it coming out there? So what I'm going to do next is sift it. This is basically just a screen, fits on top of this bowl. And I'm going to pour it in this way. That will remove all the larger bits and I'm just gonna go like that. You can see I've got some of the chaff in there and a finer wheat here.

Archive black and white illustration of grinding wheat with larger millstone. Archive video of water wheel mill. Black & white images of Sperry's Flouring Mills building, women inside Sperry factory, and two men holding bales of wheat.

Albala: [on cam] But the technology when you need to feed more and more people gets bigger. And you need to go to diff. energy sources, **[vo]** so a huge millstone makes a lot more sense, it's more efficient. And by ancient times, to feed their armies would have had to grind immense quantities of grain. A water wheel is another 1,000 years later. So, that technology comes in around 1,000 AD. By the early 19th century, there is roller technology in place.

Black & white archive image of wheat factory with boxes of flour lined up. Black & white image of people standing with "Germea for breakfast" advertisement.

Narrator: So if milling technology has changed so much, I wonder what that means for the wheat itself.

Labeled animation of the three parts of the wheat seed: bran, endosperm and germ.

MP: Well, wheat is good for us if we eat it in its whole grain form. All parts of the seed have everything a life needs. Has bran, which the fiber is a very

good food for the microbes in your body, has energy in the form of the endosperm, it has various oils in the germ. So, it's an incredibly nutritious food. But, this is not how Americans eat wheat anymore.

Zoom out of outside of commercial mill elevator. Miller pulls flour out of machine. Machines fill and empty with grain. Miller holds bran, touches white flour and looks into seed cleaning machine.

MP: 95% at least of the wheat that we eat has been refined, which is to say the bran and the germ, the two healthiest parts, the two most nutritious parts, are discarded. And we pig out on the white flour.

Narrator: That bran and germ helped us digest gluten in the first place. Without it, we're left with this starchy white flour. And it might be that the more of it we eat, the more sensitive we get.

MP: What happens to the good part? Well, ironically enough, we feed it to animals on feed lots, and we feed it back to people who are starved of nutrients in the form of vitamins. It's brilliant. It's a great business model. It's terrible nutrition.

Black & white archive image of Lane's Mills. Black & white image of men carting around bags of flour in warehouse, of Germea flour product and little girl holding bread roll. B & w image of several men in overalls lined up in front of mill.

Killilea: [vo] Originally, this didn't happen. Originally, **[on cam]** every little town had it's own little mill, usually a stone mill, and you'd go down and you'd pick up a bag of flour -- that would be whole ground. So it would have all the nutrition. The downside is, it would have all the natural oils...those oils will go bad over time. They become rancid. With the growth of our nation and the commercial agricultural and food industry started shipping products everywhere over the US, that became untenable.

Modern milling machines shaking inside industrial mill. Miller inspects white flour in tubes.

MP: And then somebody figured out how to do it. They invented these things called roller mills. It breaks off the bran and the germ and that's thrown out. Now you had this white flour that you could ship all over the world, it wouldn't go bad. It was one of the biggest changes to the human diet since cooking was invented.

Closeup of stacked bags of ConAgra Mills all-purpose flour. Man bags flour at bagging machine.

Narrator: Except that white flour is making me sick. So what about whole wheat flour? If all the parts of the wheat seed are still there, then shouldn't whole wheat flour be okay for me?

Bags of flour go down conveyer belt. Miller walks down aisle of machines filling up with flour. Still photo of sliced "whole grain" bread.

Killilea: [on cam] There's another shortcut that one can take. If you want to claim that your product is whole grain, but **[vo]** you have to buy flour from the commercial roller mill industry, you have the capability to add back your own bran or your own part of the germ. So that's done, to some degree. **[on cam]** Some places add just the bran back, so they can then claim, oh this is "whole grain." But is it really whole grain? No, not really.

Pan down jungle of tubes inside mill. Mark Shigenaga sits in lab with flour samples.

Narrator: So whole wheat flour is actually just white flour with some bran thrown back in? Then I found out that this way of milling and marketing is very American.

Mark Shigenaga: [on cam] (Narrator: and they don't do that in europe?) They don't do that in Europe. (what do they do?) They take the whole grain, and they mill it whole. (They don't take the bran out and the germ out). They don't take the bran, or the germ out, no. What they do is the mill it whole, and if there's large particles, they sift it off.

Archive footage of stone mill at work. Still photo of Maggie. Archive footage of bakers inspecting loaf of bread. Closeup of whole wheat flour bag.

Narrator: This whole milling, or stone ground milling, as it's called, is basically what we had been doing for centuries before roller mills were invented. And in some places, they still use it.

Shigenaga: [on cam] If you go to France, and you get your breads from a baker that uses whole milled flour, then you can eat it.

Narrator: This may sound crazy, but what Mark was saying seemed to make sense. When I lived in France three years ago, I had no problem eating bread, but as soon as I got back to the States, I knew something was wrong. I couldn't be sure that this was the cause of my intolerance, but what I did know was that "whole wheat" wasn't as whole as I thought it was. In fact, I still wasn't quite sure what the whole wheat label meant.

Pan down still photo of loaves of bread on grocery store shelves. Closeup of ingredients on back of bread bag. Woman and her two children pull out a shopping cart and walk into a grocery store.

Killilea: [on cam] The FDA allows for whole wheat statements of health to be added to products as long as 51% or more of the flour is whole grain. So you can have a bread made from 51% whole wheat and 49% all purpose. **[vo]** You're still losing a lot of those nutrients. So when you go to the store, you buy a loaf of bread that says whole wheat, you're really not sure what you're getting.

Maricela Lopez comes down aisle with two children and picks out bags of bread in aisle. Anna Villalobos points to bags of bread in aisle.

Intercom: [vo] Price on English cucumber.

Maricela Lopez: [vo] I used to buy white bread. **[on cam]** Look, this one is wheat. But it's not 100% whole wheat. Because of my budget, I have to go for the best, but cheaper.

Anna Villalobos: [on cam] In this section, you're gonna find all the 99 cents loaf of breads. This one that is the better kind of bread with the 100% whole wheat on it, one of this is the same thing that three of this. What do you think is going to be your option? Even if you ask them out on the street, do you want this or do you want this? They gonna take this one.

Tracking shot down aisle of bags of bread on their shelves. Maricela reads label on bread package.

Narrator: What the label doesn't say is how much of that bread is 100% whole wheat. The industry requires only that the first ingredient need be.

Which wouldn’t be a big deal if we were sticking to the traditional recipe. But today’s bread is a bit more complicated.

Lopez: [on cam] I don’t like this ingredient, high fructose corn syrup, wheat, gluten, soybeans and cottonseed oils, salt, honey, detam, ascorbic acid...

Lopez picks up her bag of bread at checkout counter and exits. Man pours salt into dough mixer inside bakery.

Narrator: The list went on. How had we gotten so far away from just those three simple ingredients, flour, water, and salt?

Begin music. Slow-motion footage of man dusting counter with flour and rolling dough inside bakery. Archive still illustration of “enriched flour” bread package.

MP: We’d taken this very healthy food, and we’d processed it to the point where it was not only less nutritious, but it was actually bad for you, So, the solution they hit on, it’s a classic capitalist solution. Rather than return to whole grain milling, and say return to improving the quality of that, um, they figured out that they could just add these missing vitamins back, and they did. They could boast about the fact that they had extra nutrients in this food. Nutrients, of course, that they had taken out themselves.

Large mixer turns out dough. White circles of dough in trays move through bread factory.

Albala: [on cam] By the early 20th century, most bread that people eat is mass produced. And I think by the middle of the 20th century, that becomes standard, when people think of bread, they think baked in a loaf pan, white sliced poofy, that’s got conditioners and bromates to make it whiter, and additives.

Black & white archive Wonder Bread commercial.

Archive VO: Because wonder-soft whipped bread is made from batter, not dough, it has no holes. Get wonder soft whipped.

Baked loaves of bread move down conveyer belt in trays. Loaves proceed up angled conveyor belt. Zoom out on long conveyor belt of baked bread.

Albala: [vo] White bread has always been a marker of status because you're throwing away a lot of the bread, and everything that would make bread brown and interesting. So whiteness always equated with wealth. I think that changes only when the technology is able to make mass produced white bread. The industrial wonder bread kind of sliced white bread then becomes a marker of **[on cam]** being low class. Which is totally, totally opposite. Switches entirely.

End music. Begin new music. Man walks down street. Enters a shop. Starts mixing flour and water at counter. Still photo of Chad and Liz.

Narrator: I found out about Chad Robertson and his San Francisco bakery, Tartine. Chad wanted to make a good loaf of wheat bread that was digestible, because his wife, Elizabeth, was gluten intolerant.

Photos of Chad & Liz in France. Robertson mixes flour and water in large tupperware.

Narrator: I found out that the couple had once spent a year in France, where Elizabeth had no problem eating bread, just like me. I had to know how a woman with gluten intolerance was married to a man who made his living working with bread.

End music. Robertson and wife sit at restaurant table together.

Chad: There was one time where I remember you eating like half a loaf, and I thought it was crazy, and you had no effects at all. But it was really a one time thing that happened. (half a loaf of?) It was a loaf of emmer, which is a very old wheat variety, and it's really soft, it's hard to make....

VO Chad & Liz continuing conversation

Narrator: I should've seen this one coming. Emmer? This was the $100 bottle of wine answer again. But just as I was about to leave disappointed, I learned something else.

Chad: ...If I make a loaf for Liz or someone who has a gluten intolerance, I'll choose some of these softer wheats, and I'll make sure that it's really fermented, for like 24 hours.

Robertson prepares loaves of bread by hand and puts them into oven.

> **Narrator:** For most of his breads, Chad used a blend that was more white than whole wheat. So in terms of ingredients, this was nothing special. But it's what he *does* to that flour that's so important. This was the final big change that occurred in bread in the last couple of generations.

Albala shows a bowl full of a white mixture (the starter). Filmmaker comes in from off-camera to sniff starter.

> **Albala: [on cam]** This is my starter over here. Her name is babycakes. Don't ask me why. I named all the other ones after saints and things.

Albala spoons his starter into a bowl.

> **Oppenheimer: [vo]** Up until WWII, almost all bread was made the old fashioned way, through a sourdough starter. And sourdough starters, despite all their mystique, are very simple. It's just you let flour and water sit for days, you've gotta tend it a little bit, refresh it, and **[on cam]** it becomes this fermented, kind of stinky goo.

Man folds dough in basket. Robertson enters walk-in refrigerator, pulls out baskets of rising dough.

> **Narrator:** This is what Chad, and other bakers, including those in France, were doing. They used a sourdough starter, which collects bacteria and yeast from the air around it, and when mixed with dough, helps bread rise. How did this change?

Archive sepia image of a man (Louis Pasteur). Archive footage of scientists looking at yeast under microscope. Still images of packets of dried yeast. Zoom out on "bun parking garage" in bread factory.

> **Oppenheimer: [vo]** About 100 years ago, the great Louis Pasteur realized **[on cam]** there was this one yeast that was particularly powerful, called saccharomyces cerevisiae.

Narrator: Nowadays, it's called instant yeast. You know, those little packets of dried yeast you get at the grocery store.

Oppenheimer: [vo] This turns out **[on cam]** dough very fast, it makes bread making fairly idiot-proof. So for big commercial bakeries that needed a lot of bread and a recipe that could be done by anyone they hired, this was a godsend.

Albala shows his starter. Archive still image of jar of dried yeast.

Narrator: Okay, so we traded regular yeast that grows in our kitchens for the easy instant kind. What's the big deal?

MP: There are people with gluten intolerance that can eat a long fermented bread without any problem.

Narrator: This is because the longer you ferment bread, the more time the yeast has to break down the gluten, sort of pre-digesting it for us.

Robertson rolls out trays of dough next to oven, sets oven, prepares loaves to go into oven. Loaves go into oven.

Robertson: [vo] In my first apprenticeship in baking, we were letting the breads rise for 7 or 8 hours. and now, I'm doing like over 24 hours. Like the longer you ferment something, **[on cam]** the more flavor you're creating and you're also making it more digestible, so it's all connected.

Narrator: Chad had me convinced. I tried his bread, and sure enough, I didn't get sick! And it tasted amazing. It seemed like I had found my bread. Except for one thing.

Begin music. Bird's eye shot of man pulling bread from oven. "Tartine Bakery & Cafe" sign through window at night. Couple drinking wine and eating bread outside Tartine at night.

Customer: [vo] We like to come here and get a bottle of wine and get a hot loaf of bread. **[on cam]** It's very expensive here, but it's worth it, so. (How much did you spend on that loaf of bread?) It's almost $9. Very expensive.

End music. Fresh loaves of bread are pulled from oven at bakery by another baker. Man cuts dough in braids. Archive black & white footage of children smiling, eating white sandwich bread.

Narrator: $9 is *fine* every once in awhile, but I can't afford that all the time.

Narrator: Is gluten intolerance just a rich white person's problem?

Killilea: [on cam] No, I don't think so. I think it is a national issue. **[vo]** Every single person could have a gluten sensitivity at any point of time in their life. Every time you eat all-purpose flour generated products at high levels, you're taking a chance.

People walking on city sidewalk. "St. Anthony Foundation" sign on building. People serve trays full of food, including bread. Man sits at table eating bread from tray of food. Closeup of tray.

Char Marsden: [on cam] Most of the bread that we get is all donated except for two meals a year. **[vo]** It's so not feasible for us to get donated high quality bread every single day.

Roger: [on cam] I like white bread because it's softer and it's what I've been raised up on. My mother raised me up on white bread, not wheat bread. If I go to the store, they even have white bread that's a 100% wheat that's white. I don't like that bread. I like white bread. So I go for white bread. It's just my preference, my choice, and I'm not saying that the other one's bad, in fact I know, from just listening and hearing studies and seeing, this stuff is good for you. But it's just not favorable to my taste buds. That's basically...am I making sense?

Timelapse of sunset into night of city skyline. Miller walks down aisle of tubes of flour. Two men fill tractor in field. Two bakers roll dough. Circles of bread dough move down conveyer belt in factory.

MP: Celiac and gluten intolerance may be a door through which we can learn something much larger about where we've gone wrong in our relationship to these plants and these foods that have served us well for thousands and thousands of years. And suddenly that relationship is problematic. Um, is that the wheat's fault, or is it ours?

Tractor drives across field. Villalobos and Lopez look at packages of bread in the grocery store. Robertson places freshly baked bread onto shelves. Two men talk at St. Anthony's while eating. Maggie talks to one of the men at a table at St. Anthony's. Loaves of freshly baked bread move down conveyer belt in factory toward camera.

> **Narrator:** I don't know whose fault it is -- if it's the wheat itself, the way it's milled, the change in fermentation, or all of it. It's just nice to have options, even though they're expensive. But I can't help but think that what the industry has made cheap and accessible, isn't always the best for us. And that's the trouble with bread.

Trays of bread move down conveyer belt into and out of large industrial oven. Credits:

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