

Citrus Test

How the Orange Juice Industry Is Emblematic of Commodity Agriculture



*It's not widely known that orange juice benefits from a gap of sorts in the industrial agriculture catalog of chemical horrors. Ninety percent of the pesticides used on citrus are used to preserve appearance, and appearance is not an issue for oranges that are destined for converting into juice. That's the good news. The not-so-good news can be found below, where author Alissa Hamilton serves up a sampling of her fascinating book on the orange juice industry, *Squeezed: What You Don't Know About Orange Juice*. Like many other elements of our food heritage, the juice of the most beloved citrus has emerged from a century of marketing and processing as something completely transformed, a troubled descendant of what it was. Once a luxury served in affluent homes and enjoyed seasonally by farm families with access to their own trees, most of the orange juice consumed by Americans today is the result of a fairly bizarre process. But let's give the floor to Alissa Hamilton and her thorough research.*

Alissa Hamilton

ACRES U.S.A. Let's say you go into a store to buy orange juice, and your best option is something that says "fresh-squeezed" or words to that effect on the label. What is in that orange juice?

ALISSA HAMILTON. There aren't too many products recently that actually advertise their processed juice as *fresh-squeezed*. They certainly *suggest* it, imply it by the pictures on the carton or the ads you see on TV, but those two words together, *fresh*, *squeezed* — hopefully companies have stopped doing that. That said, Tropicana's new carton actually had a statement at the top: "squeezed from fresh oranges." So you can see the extent to which companies are still trying to convince consumers — that sounds awfully like fresh-squeezed, but clearly it means something different. We would hope that the oranges that they squeeze are fresh when squeezed.

ACRES U.S.A. They'll say "squeezed from fresh oranges," or they'll say "not from concentrate." What does that mean, really?

HAMILTON. "Not from concentrate" refers to a pasteurized orange juice, and this is sort of complicated because you usually see the words "not from concentrate" in much larger font than the word "pasteurized." The industry fought hard not to have to declare on the carton that the juice was pasteurized because they were concerned that consumers would be turned off. What usually happens today is that in order to have a 365-day supply of orange juice, the big brands are storing their product for up to a year. They store them in these huge aseptic storage tanks — that means the juice is stripped of oxygen before going into the tank so that it doesn't oxidize in the tank and go bad. When the juice is stripped of oxygen, it is also stripped of flavor-providing chemicals. The companies then hire flavor and fragrance companies to engineer flavor packs to add back to the juice to make it taste fresh. You can see in the name the whole idea behind the slogan "not from concentrate" — it is a better, higher-quality, fresher juice than from concentrate, with the idea that from-concentrate is an inferior product. But in fact, not-from-concentrate juice is

also a heavily processed product. Many of the ads show the oranges being squeezed and then going right into the carton or a straw punctured into an orange suggesting that this is pretty much straight from the tree, but it's not.

ACRES U.S.A. It sounds like pasteurization is only one link in a much larger chain of processing.

“The industry fought hard not to have to declare on the carton that the juice was pasteurized because they were concerned that consumers would be turned off.”

ALISSA HAMILTON. Many people assume the pasteurization process is the big issue, but pasteurization technology has advanced pretty far over the last few decades. We now have flash pasteurization technology, and it's possible to have a pasteurized juice that still retains much of the original flavor. It's really the storage end of the process where the flavor is lost, and then you get pretty significant manipulation. Some of the big companies used to store their juice in frozen slabs of fresh-squeezed juice, but in the 1990s they started to shift over to aseptic storage technology simply because of cost. If you talk to some of the people who were around in the industry right from the start, they'll say that the not-from-concentrate juice tasted much better when the juice was stored in these frozen slabs of fresh juice. You didn't need the flavor packs at that time because the juice wasn't going through this process of aseptic storage.

ACRES U.S.A. What's the difference between a frozen slab of orange juice and concentrate?

HAMILTON. Before it's frozen, concentrate has been boiled down, and again, the flavor-providing chemicals are lost during this process. They're volatile — they evaporate, escape under high heat. When you buy from-concentrate in a carton, it's been reconstituted for you, whereas in the 1950s, 1960s and prob-

ably 1970s, you could still buy a can of frozen concentrate in the stores. You would dilute it — the standard was 3 to 1. The companies realized that convenience was really important to consumers, so they started to reconstitute the juice for them. That's when the name “not from concentrate” came about. Pasteurized juice producers had to decide what to do, because it's much

cheaper to make a from-concentrate juice. Simply the storage costs — from-concentrate is made from space-saving concentrate and that's much cheaper to store than a full-strength pasteurized juice — forced pasteurized juice producers to think about the future of their product, about what they were going to do. They were thinking about shifting over to concentrate technology and just doing away with pasteurization, because up until then their whole selling point for the pasteurized juice was the convenience. But now they'd lost that edge, so it was either switch to the concentrate

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technology or try and figure out a way to sell the product at a higher price. That's when they came up with the slogan “not from concentrate” — the whole idea being, this is a better product and so you pay a premium for it. That's how the pasteurized juice producers stayed in business, by selling their product as a fresher, higher-quality product. If you look into the processing, then you can start to question whether this is really

the case and whether it's worth it to pay that kind of premium.

ACRES U.S.A. Could we call it a shell game?

HAMILTON. I suppose you could. I have an issue with the marketing of the juice as a fresh product. It's misleading advertising, and consumers have really bought into the stories that are told, and it's really representative of more than orange juice. *Squeezed* is specifically about orange juice, but orange juice is really emblematic of many products on the market. It's a good starting point to reassess the information we're receiving about our food because so many of us do drink it and seem to care that orange juice is not this simple, pure product as advertised.

ACRES U.S.A. How long has the word “fresh” been a serious bone of contention?

HAMILTON. There was a long struggle in the 1990s, when FDA Commissioner David Kessler confiscated thousands of gallons of product of Citrus Hill, Procter & Gamble's orange juice. Citrus Hill was advertised as “fresh from concentrate,” and Kessler said that this didn't make sense, that they couldn't use “fresh” on the carton. Procter & Gamble refused to take that word off, because they said it

signified to the consumer a flavor rather than a process. As a result, Kessler confiscated the product, citing misleading advertising. So that word “fresh” appearing on the carton of orange juice has a long battle behind it.

ACRES U.S.A. As a result, that's not a word you're going to see very often in the juice aisle at the grocery?

INTERVIEW

HAMILTON. I hope not. But you never know what companies will try and get away with, and orange juice is pretty low on the FDA's radar. For instance, Citrus Hill also advertised their juice in the 1990s with the phrase "nothing added." They voluntarily agreed to remove that claim because they were adding essence and oils

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to the juice. Then in 2004 there was a huge ad on the way to the Bradenton processing plant, Tropicana's largest processing plant, saying, "nothing added, almost nothing removed." Although Procter & Gamble in the early '90s agreed to remove that claim, here it is again, 10 or 15 years later.

ACRES U.S.A. Since flavor is added back into the product, "nothing added" is more than a little dishonest?

HAMILTON. There's the whole issue that these flavor packs aren't labeled because the industry argues that they're made from orange essence and oils, so it comes from the orange, so you shouldn't have to label it. But the flavor companies have taken the essence and oil and broken them down and come up with their own concoction. In the 1960s there was this whole debate about whether they should allow essence and oil to be added back to the juice, and the FDA's concerns were, one, that it would mask poor-quality juice, and two, they didn't want it being added back in levels in excess of what would be natural to the juice. In the '60s the companies really were just adding back the essence and oil in its crude form. The first two questions for the FDA in the '60s were: do we allow them, and do they have to be labeled? They decided that they could allow them and that they didn't have to be labeled. The companies were insistent that they weren't using it to mask poor-

quality juice, and they weren't using it in excess of anything found in nature. Well, you can ask anybody in the industry now, and these flavor packs that are being added back to the juice resemble nothing that would be natural to the juice. If you tasted the juice coming out of aseptic storage tanks, it would taste like sugar water,

so clearly the flavor packs are being added because the stored juice is not anything that consumers would want to drink.

ACRES U.S.A. Were you able to visit facilities where they have these aseptic tanks?

HAMILTON. Yes. I didn't actually taste the juice coming out of the tanks, but I saw the tanks, million-gallon tanks, maybe the size of football fields. That contrast between the very high-tech industrial terrain of the processing plants contrasted with the pictorial scenes that you see on TV of birds chirping and oranges growing on these Garden of Eden-like trees — there's a stark contrast.

ACRES U.S.A. Do the juice companies insist that the essence and the oil are harmless and so on?

HAMILTON. Yes, although they don't even get to "harmless." They say it comes from an orange, so they don't have to label it. That's really my concern, that these flavor packs are not being labeled. If consumers saw that there were flavor packs added, they'd have some idea that this juice is not fresh from the tree as advertised, that there is significant processing behind the product they're drinking.

ACRES U.S.A. Do you think processing is just a bad road for food even though it might be harmless chemically?

HAMILTON. The fresher, the better — it's always better. That's why my Dad buys organic oranges and squeezes them. That's what he drinks for juice. Of course you're going to get a better product and a better-tasting product.

ACRES U.S.A. Unlike milk, it isn't legally required to pasteurize orange juice?

HAMILTON. No, it's not required by law. This gets kind of complicated, but in the 1960s the FDA decided to standardize orange juice. There were a number of different orange juices on the market that each had their own standard of identity and simply the fresh, raw juice was one of them. In fact, one part of the story that I found so surprising was that the orange juice industry was originally developed to help save Florida growers, who were struggling at the turn of the 20th century with a surplus of oranges. The growers had to figure out what they were going to do, either cut down production or try to increase consumption. They took the latter route. They organized into what was called the Florida Citrus Exchange, which sent juice extractors to homes across the United States and even the world, with their "Seald-Sweet" logo on the extractor. The whole idea was that if you drink a glass of orange juice you're consuming more oranges than if you eat the oranges fresh. That was the beginning of the juice industry, and even the idea of bringing orange juice into homes everywhere. It used to be a luxury — oranges in general were a luxury item because of transportation costs and a whole number of factors. In fact, for many centuries, it was the fruit of royalty. In France it was known to be the fruit of kings. But that's a long story.

ACRES U.S.A. If you're having breakfast in an ordinary American middle-class home in 1905 or 1910, they probably don't have orange juice on the table?

HAMILTON. Exactly. Unless maybe you're living in Florida and have an orange tree in your back yard. No. The average person wasn't drinking orange juice at the turn of the 20th century.

ACRES U.S.A. It's interesting that almost nobody knows this.

HAMILTON. People don't really think about it. I think orange juice is a perfect product to investigate because we do take it for granted that everybody drinks it, and we've always been drinking it, and it's a good way to start your day. People don't really stop and think, *why* do I drink orange juice, why does all of North America, all the world think that orange juice is part of a balanced breakfast? You go anywhere and they serve orange juice for breakfast.

ACRES U.S.A. Surely there is a nutritional case that can be made for it?

HAMILTON. I'll get to the nutritional part. What I just told you was half of the beginning of how we all came to drink orange juice. The other half was World War II and the Army's request for a good-tasting orange juice. Until that time the only processed orange juice on the market was a canned orange juice that had a reputation for tasting like battery acid. It was a by-product of the fresh juice industry, made from what were called "elimination," the fruit that didn't make the grade to be sold fresh. The Army resisted giving nutrients to their soldiers in the form of pills. They really wanted to supply all the nutrients through food. They actually had a citrus product made from lemon crystals for one of the rations, and the soldiers wouldn't drink it. This was a real problem, in fact. Earlier research I did about war rations turned up the trend that if soldiers are given a choice between nothing and bad-tasting rations, they chose nothing. So there was a lot of research into how to make the rations palatable. This was why it was so important to come up with a juice that tasted good that could supply the soldiers with their vitamin C. A team of three formed, they invented frozen concentrate and patented it in 1948 — unfortunately too late for the war. Nevertheless, the product was specifically designed for soldiers fighting overseas to supply them with their vitamin C. Sure, orange juice is a good source of vitamin C for soldiers without access to fresh fruits and vegetables, but most of us are not fighting in the field and can go to the farm-

ers market or grocery store and choose fresh foods. For instance, an orange has more vitamin C than a glass of processed orange juice.

ACRES U.S.A. Did Florida always dominate as the orange juice market expanded?

HAMILTON. In the United States, yes. About 95 percent if not a little more of the oranges grown in Florida are for processing into juice. The reverse is true in California. Almost all the oranges grown there are grown for fresh consumption and that's simply because of the different varieties that grow well in California versus Florida. California grows a really good navel which has been marketed as the fresh orange of choice because of the thicker skin and the segments — it breaks out nicely into individual segments. If you buy, say, a Valencia, which is known

couldn't afford to go through a period without providing it to consumers. They had to look for another source, and they turned to Brazil. The Florida industry sent people over to Brazil to develop a processing infrastructure there, and the industry in Brazil grew to the point that now it's taking over the production of orange juice, and Florida growers are really suffering. An industry that was developed to help save Florida growers has grown so far out of control that it has now effectively made Florida growers redundant. The industry is really moving to Brazil, where land is cheaper, labor is cheaper, and there are fewer environmental regulations. Brazil now grows far, far more oranges for processing into juice than Florida.

ACRES U.S.A. Was government support important to the original expansion of the juice industry?

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in Florida as the Cadillac of oranges for juice, it's thin-skinned and very juicy and not all that convenient to eat, kind of messy. That said, it's very tasty, very sweet. In 1948, after frozen concentrate was patented, then Bing Crosby started crooning about Minute Maid and how it tasted just like fresh-squeezed, and that's when orange juice really took off.

ACRES U.S.A. Why do we hear talk of Florida's orange industry facing hard challenges these days?

HAMILTON. Florida is hit with periodic freezes, and that's been the case forever. In fact, it was somewhat helpful to the orange growers for decades, because it helped control supply. But in the 1980s, when North Americans had become so accustomed to having their juice, Florida

HAMILTON. The state has always been heavily involved, the State of Florida. For instance, it was involved in the funding of this team of three who invented frozen concentrate.

ACRES U.S.A. Did the Florida growers enjoy subsidies or import protections to kind of lock in their dominance?

HAMILTON. There's actually a tariff on imported juice that they fought for. After the 2004 hurricane, in September or October of that year, George W. Bush flew down to Florida and promised to keep the tariff on orange juice. That has helped, but with free trade being the predominant policy, that tariff seems to be continually threatened and a concern to Florida growers. If they lose that tariff, they simply can't compete with Brazil.

ACRES U.S.A. Since they have to put flavors back because of what is lost during storage, what kind of elements are we talking about and how do they put them back?

HAMILTON. That's a good question and it leads also to the question of why they're not labeled. The essence and oils from the juice are lost when the juice is stripped of oxygen. The flavor packs are made from essence and oils. Orange essence is made up of a number of chemicals — ethyl butyrate is one of them. The flavor companies now are so sophisticated, they can break down essence and oils into the individual chemicals — they have discovered that, for instance, ethyl butyrate is one of the chemicals that

into the individual chemicals and then mix and match to come up with the flavor pack. Each brand has its own signature stamp — for instance, Minute Maid has a reputation for having a candy-like flavor — and in fact some companies request a flavor pack that tastes like “X” brand. There's this hall of mirrors for flavor packs where you have one trying to imitate another, which in turn is trying to imitate another, which are all trying to imitate the flavor of a freshly squeezed orange.

ACRES U.S.A. These are the labs that have mastered the essentials of flavor, that can make a hamburger taste like a strawberry or butterscotch taste like rhubarb?

“The smaller growers are really struggling because the big companies aren't contracting with them anymore, they're only contracting with the bigger growers and then importing from Brazil.”

North Americans associate most with the flavor of a freshly squeezed orange. The flavor of an orange is very complex. It's not the case with all flavors — there are flavors out there that you get primarily from one chemical. The flavor of an orange, on the other hand, is made up of a number of chemicals. That's why it's actually quite expensive to recreate, and these flavor packs are very sophisticated concoctions. That said, in Brazil or elsewhere, where the palates are different, they might emphasize a different chemical. Depending on where the juice is being sold, the flavor pack is tailored to the particular tastes of that population.

ACRES U.S.A. What goes into this process?

HAMILTON. What they do is they break down the essence and oils into the various chemicals. There is oil that comes from the peel and then there's oil that comes from the essence. *Essential oil* is just a broader terminology; there's a water-based essence and then there's oil, so they break down the essence and oils

HAMILTON. Exactly. The flavor and fragrance companies, the same companies that also make high-end perfumes. Firmenich and Givaudan are two of the bigger ones. Now, because Brazil grows the most oranges in the world, they lead orange production for juicing, and the flavor and fragrance companies are getting a lot of the flavor material from oranges grown in Brazil. We don't know how they're growing the oranges, what pesticides they're using. They certainly don't have the same kind of regulations we have here.

ACRES U.S.A. The mass marketing of organic food and processed organic food is creating a confusing food landscape. How should a person buying organic juice regard what's on offer at supermarkets?

HAMILTON. When I was researching, organic was such a small segment of the industry that I didn't look in detail. There are organic juices that are made from concentrate, so you're getting the same boiling down and reconstituting,

the same number of steps. If you're buying a not-from concentrate organic juice it probably is not sitting in aseptic storage, however, because they probably are not producing the quantities of the juice to necessitate storage in these million-gallon tanks. My intuition is that you're still getting a heavily processed product unless the juice says it's fresh-squeezed. The best-before date is really a good indicator of how fresh the product is. If you're getting a juice that has a shelf life of 60 days, you know that it's not going to be all that fresh. After the hurricanes the Florida Department of Citrus realized that they really needed to come up with programs to help Florida growers because they had been beaten up on so many ends, so the Department of Citrus came up with this program to send bags of fresh oranges to supermarkets in the north where the oranges would be squeezed in front of consumers and then bottled right there — so you were getting a really fresh-squeezed product. Ironically, the processing industry has made this move to go back to a fresh-squeezed product to support Florida growers and help the industry, which has been struggling for so long.

ACRES U.S.A. No doubt the Florida growers pay their laborers very fair wages and give them nice housing and benefits?

HAMILTON. In an ideal world that's what they would do. The labor conditions certainly have been an issue on and off in the media for years. I didn't witness any of it firsthand, but I certainly know that orange picking is one of the hardest jobs in agriculture simply because of how the pickers walk around with these bags on their backs. They're going up and down ladders with these really heavy bags and a farm worker I spoke with said that at night he just had to drink alcohol to take away the pain from the labor. They use a lot of migrant labor, and the wages are pretty low. I also have those figures in the book.

ACRES U.S.A. It seems that within every industry there's some kind of conflict that's been going on for a long time. Is this true of the juice industry?

HAMILTON. There's certainly an internal struggle between the growers and the processors, the multinational corporations. Tropicana started as very loyal to Florida growers and loyal to keeping the company local or domestic. Now it's been taken over by Pepsi, and Simply Orange and Minute Maid are owned by Coke, and these are multinational corporations, of course, so there is a conflict between importing juice from Brazil versus buying from the local growers in Florida. The smaller growers are really struggling because the big companies aren't contracting with them anymore, they're only contracting with the bigger growers and then importing from Brazil. That's where the Florida Department of Citrus comes in. They originally were supposed to be supporting the Florida growers, but now they talk about supporting the "Florida juice industry," which includes the processors, so there's a conflict of interest where the Florida Department of Citrus is supporting these multinational corporations that are importing from Brazil, the prime competition for the Florida grower — you can see what kind of mess that can make.

ACRES U.S.A. Does the juice business send a lot of lobbyists to the Florida legislature to move agendas their way?

HAMILTON. The multinational corporations certainly have, and even Brazilian processors have set up shop in Florida, and they're dictating much of what goes on. I don't even know that you'd call it lobbying. The Florida Department of Citrus is small enough that they have representatives of the multinational corporations on their board.

ACRES U.S.A. That sounds like a pretty blatant conflict of interest!

HAMILTON. I won't call it that. I'll let you draw your own conclusions.

Alissa Hamilton is an author/independent scholar and a Food and Society Policy Fellow with the Institute for Agriculture and Trade Policy (IATP). She is now working to legislate a community right-to-know how food is produced. Her book, *Squeezed: What You Don't Know about Orange Juice* (Yale University Press), is available from Acres U.S.A. for \$30, plus shipping and handling.



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