Meatblock.io

Meat, Poultry, and Seafood Traceability from Farm to Table Incentivized With Tron Blockchain Network Technology

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Abstract: The world wants and needs complete end to end meat/poultry/seafood traceability. The market is extremely large; $7.3 Trillion USD projected in meat sales for 2025. There are no current solutions that provide the consumers what they want and need. The founders of meatblock.io have had one foot in the technology world and one foot in the meat world for 20+ years and have the skills to make the changes happen.

1. Introduction

The world needs complete end to end meat/poultry/seafood traceability to satisfy consumer demands and to protect the food supply against the spreading of deadly pathogens. The technology is finally available to make this idea a reality.

Food consumers are much more sophisticated in today's world and many of them want to know specifically where the meat came from, what it was fed, how the animal was treated, how and when it was harvested, whether it was treated with antibiotics and much more.

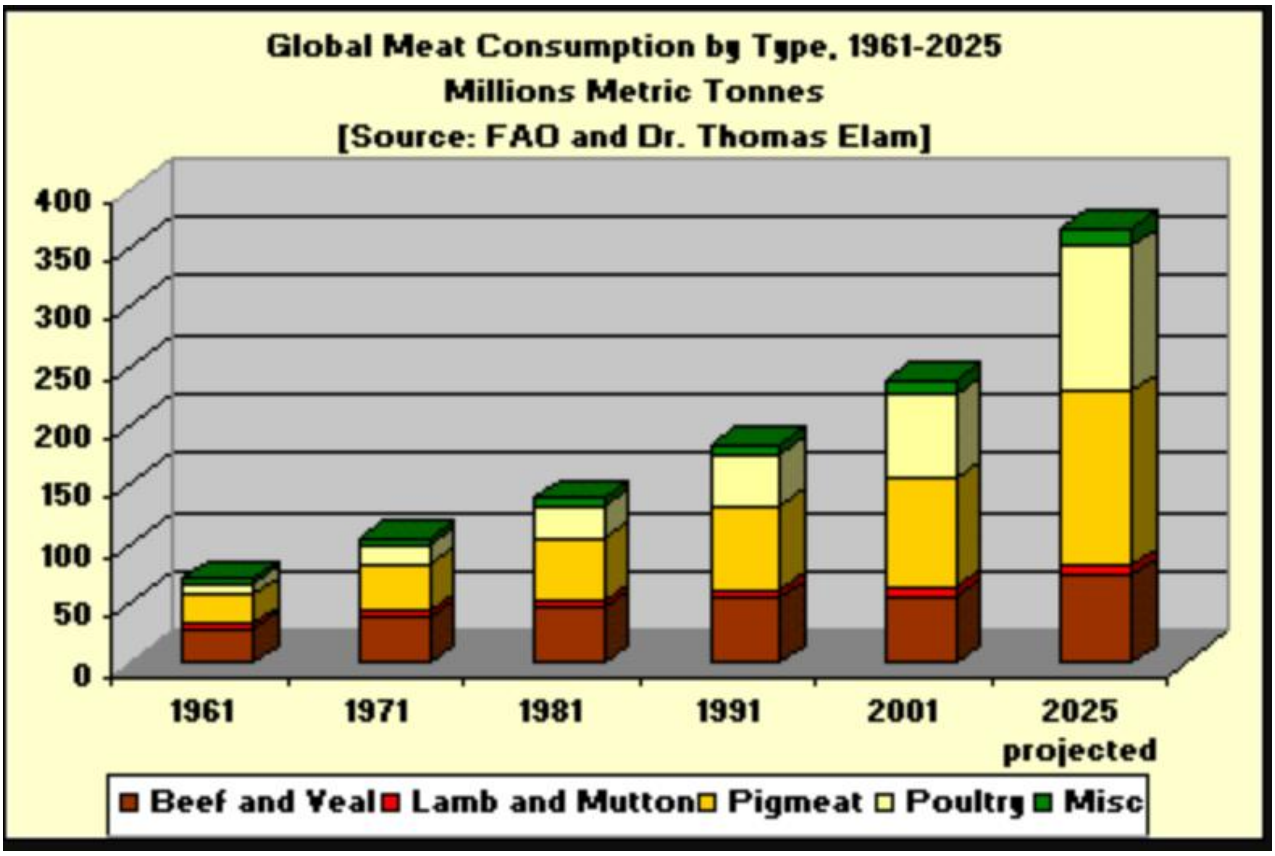
Foodborne illness is a very serious issue; hundreds of thousands of people die every year around the world - thousands die every year in the US. Billions of dollars are spent trying to combat the problem. Of the 2,000 pounds of food per capital consumed in the US per year, about 12% of it is meat & seafood. Meat and seafood products are highly susceptible to Foodborne pathogens.

Technologies such as GS1-128 barcodes and EDI to assist in food traceability have been around for more than thirty years but they still fall far short of the original promises and fall extremely short of delivering what food consumers want. One of the main problems with previous technologies has been with adoption. Many companies choose not to adopt at all; others adopt but in a limited inoperable way.

Blockchain.io will use newly invented technologies (namely blockchain, cryptocurrency, and the interplanetary file system) to develop a solution for farm to table meat & seafood traceability which not only allows the food to be tracked each step of the way, it incentivizes every player in the ecosystem to participate. Incentivisation is the key that has been missing and it is a powerful feature of these new technologies.

2. Market Demographics

By 2025, the world population is expected to be 8.1 billion; the total meat, seafood, and poultry consumed is expected to be $7.3 trillion USD per year and rising. Approximately 1.1 trillion pounds of meat, seafood, and poultry will be consumed worldwide!



Our initial focus in the United States as it is one of the largest consumers of meat in the world – as we gain traction in the US, we will expand to other large meat consuming countries.

World Beef Consumption By Country				
World		129,472,923,360	7,432,663,275	17.4
Rank	Country	Consumption	Population	Per Capita
1	Uruguay	427,696,280	3,444,071	124.2
2	Argentina	5,269,041,800	43,847,277	120.2
3	Hong Kong	839,960,220	7,346,248	114.3
4	United States	25,714,687,680	324,118,787	79.3
5	Brazil	16,532,445,380	209,567,920	78.9
6	Paraguay	489,425,640	6,725,430	72.8
7	Australia	1,580,712,540	24,309,330	65.0
8	Canada	2,094,389,000	36,286,378	57.7
9	Kazakhstan	981,055,900	17,855,384	54.9
10	Chile	952,395,840	18,131,850	52.5
11	Israel	396,831,600	8,192,463	48.4
12	Switzerland	388,013,120	8,379,477	46.3
13	Turkey	3,571,484,400	79,622,062	44.9
14	New Zealand	178,574,220	4,565,185	39.1
15	Costa Rica	189,597,320	4,857,218	39.0
16	Colombia	1,834,243,840	48,654,392	37.7
17	South Africa	1,990,771,860	54,978,907	36.2
18	South Korea	1,728,422,080	50,503,933	34.2
19	Bosnia	121,254,100	3,802,134	31.9
20	Mexico	3,979,339,100	128,632,004	30.9
21	Kuwait	121,254,100	4,007,146	30.3
22	Lebanon	176,369,600	5,988,153	29.5
23	Russia	4,221,847,300	143,439,832	29.4
24	Gabon	46,297,020	1,763,142	26.3
25	Oman	116,844,860	4,654,471	25.1
26	Dom. Republic	238,098,960	10,648,613	22.4

There are approximately 6,500 Meat, Poultry, Seafood processing facilities in the US

MPI_Directory_by_Establishment_Number [Compatibility Mode] - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J
1	EstNumber	Company	Street	City	Stat	Zip	Phone	GrantDate	Activities	DBAs
6487	V9553A	Godshall's Quality Meats Inc.	743 Hagey Center Drive	Souderton	PA	18964	(215) 256-8867	9/12/2016	Certification - Export, Identification - Meat, Identification - Poultry	
6488	V971	Supervalu Inc.	1400 West Gadsden Street	Quincy	FL	32351	(850) 875-2600	9/16/2011	Certification - Export, Identification - Meat, Identification - Poultry	
6489	V988	Maynard Frozen Foods	9455 River Road	Marcy	NY	13403	(315) 793-3334	8/5/2011	Identification - Meat, Identification - Poultry	
6490	V991	United Natural Foods Inc.	6272 McIntosh Road	Sarasota	FL	34238	(941) 925-6600	3/6/2012	Identification - Meat, Identification - Poultry	
6491	V996	United States Cold Storage	4000 Miller Circle	Bethlehem	PA	18020	(610) 997-6150	11/18/2014	Certification - Export, Identification - Meat, Identification - Poultry	
6492										
6493			**Approximately 6500 US Based Meat Processing Facilities**							

There are approximately 1,700 meat slaughter facilities in the US.

Livestock Slaughter Plants, Number by Type of Inspection – States and United States: January 1, 2015 and 2016

[Data includes 'Temporarily Closed' plants]

State	Under federal inspection		Other		Total	
	2015	2016	2015	2016	2015	2016
	(number)	(number)	(number)	(number)	(number)	(number)
Alabama	11	11	62	67	73	78
Alaska	4	3	(Y)	(Y)	4	3
Arizona	4	4	8	8	12	12
Arkansas	9	8	24	28	33	36
California	36	33	36	32	72	65
Colorado	30	28	15	15	45	43
Delaware-Maryland	21	20	1	1	22	21
Florida	25	22	(Y)	(Y)	25	22
Georgia	22	17	31	31	53	48
Hawaii	11	11	(Y)	(Y)	11	11
Idaho	12	11	16	15	28	26
Illinois	35	36	67	78	102	114
Indiana	14	12	90	88	104	100
Iowa	25	23	118	115	143	138
Kansas	26	25	62	64	88	89
Kentucky	30	28	17	17	47	45
Louisiana	1	1	30	31	31	32
Michigan	29	25	30	30	59	55
Minnesota	26	21	99	98	125	119
Mississippi	4	4	8	11	12	15
Missouri	38	33	107	104	145	137
Montana	8	5	157	164	165	169
Nebraska	33	31	74	76	107	107
Nevada	3	3	(Y)	(Y)	3	3
New England [1]	24	25	15	19	39	44
New Jersey	16	16	1	1	17	17
New Mexico	8	5	7	7	15	12
New York	43	39	26	26	69	65
North Carolina	32	28	23	21	55	49
North Dakota	9	8	35	34	44	42
Ohio	17	20	125	122	142	142
Oklahoma	9	7	59	59	68	66
Oregon	14	14	14	10	28	24
Pennsylvania	87	83	103	102	190	185
South Carolina	9	9	16	16	25	25
South Dakota	6	6	79	68	85	74
Tennessee	19	19	6	6	25	25
Texas	48	38	133	151	181	189
Utah	11	10	13	13	24	23
Virginia	23	21	32	32	55	53
Washington	17	17	3	3	20	20
West Virginia	8	8	24	27	32	35
Wisconsin	24	20	101	99	125	119
Wyoming	(Y)	(Y)	22	21	22	21
United States	881	808	1,889	1,910	2,770	2,718

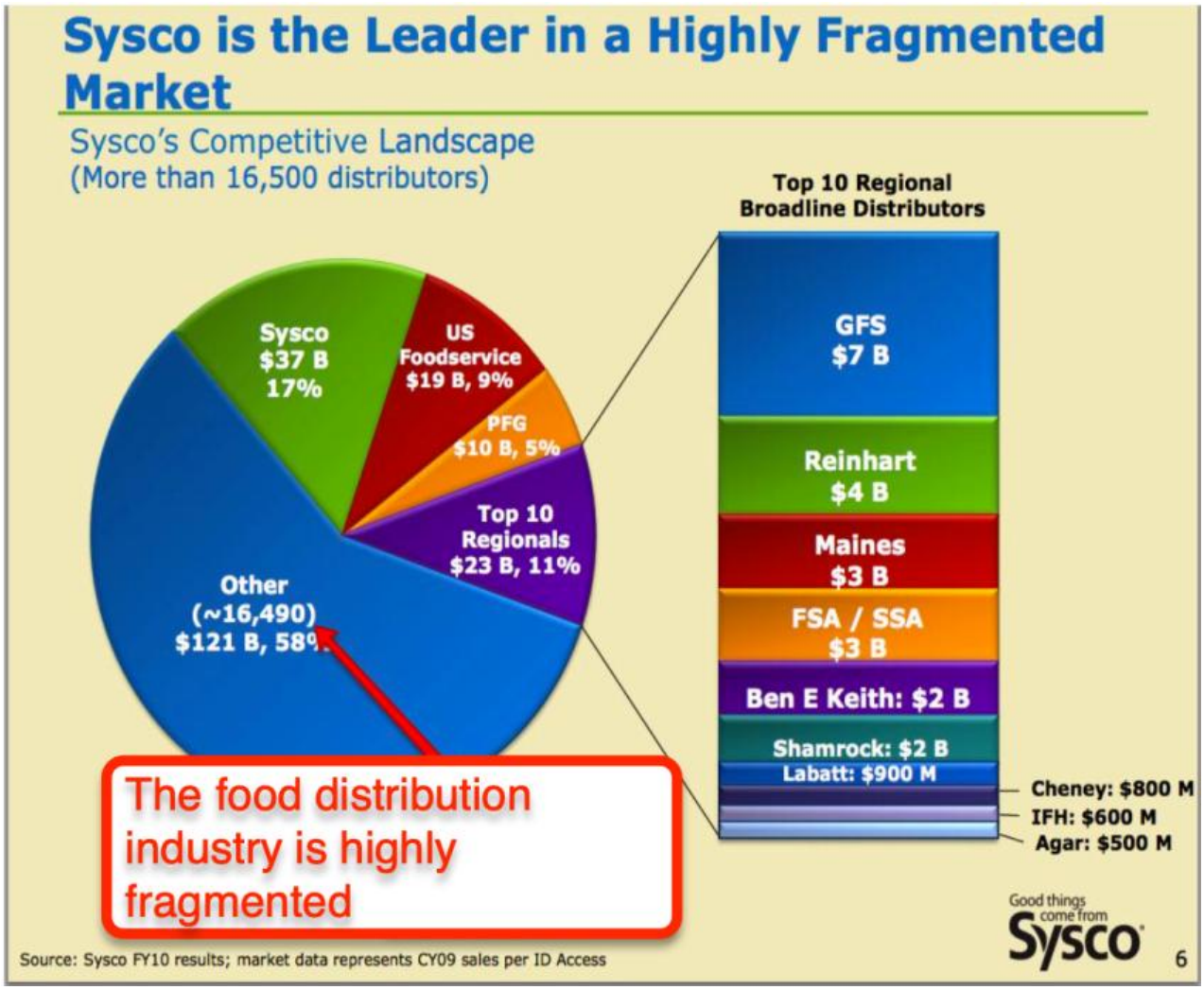
(Y) Less than level of precision shown.
[1] New England includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

There are approximately 30,000 commercial fishing vessels in use in the US

Coast Guard Documentation Port	Number of Vessels
Atlantic Coast	
Boston, Massachusetts	3,255
New York, New York	950
Philadelphia, Pennsylvania	715
Hampton Roads, Virginia	3,668
Miami, Florida	3,467
Great Lakes	
Cleveland, Ohio	155
Gulf Coast	
New Orleans, Louisiana	3,264
St. Louis, Missouri	55
Houston, Texas	2,224
West Coast	
Long Beach, California	974
San Francisco, California	1,945
Portland, Oregon	1,522
Seattle, Washington	2,835
Alaska	
Juneau, Alaska	4,335
Hawaii/Southwest Pacific	
Honolulu, Hawaii	305
Total	29,669

SOURCE: Data recorded in U.S. Coast Guard Marine Safety Informa-tionSystem by Coast Guard Headquarters, Washington, D.C., on March 31,1990.

There are approximately 16,500 foodservice distribution facilities in the US delivering meat, seafood, poultry products from processors to grocery stores and restaurants/hotels.



There are approximately 28,000 food processing companies in the US – many of which use poultry, meat, and seafood as raw materials in their products.

U.S. Department of Commerce Industry Report

Food Manufacturing NAICS 311

Industry Definition

The food manufacturing industry (NAICS 311) transforms livestock and agricultural products into products for intermediate or final consumption. Subsectors in this category include animal food manufacturing (NAICS 3111), grain and oilseed milling (NAICS 3112), sugar and confectionary product manufacturing (NAICS 3113), fruit and vegetable preserving and specialty food manufacturing (NAICS 3114), dairy product manufacturing (NAICS 3115), meat product manufacturing (NAICS 3116), seafood product preparation and packaging (NAICS 3117), bakeries and tortilla manufacturing (NAICS 3118), and other food manufacturing (NAICS 3119).

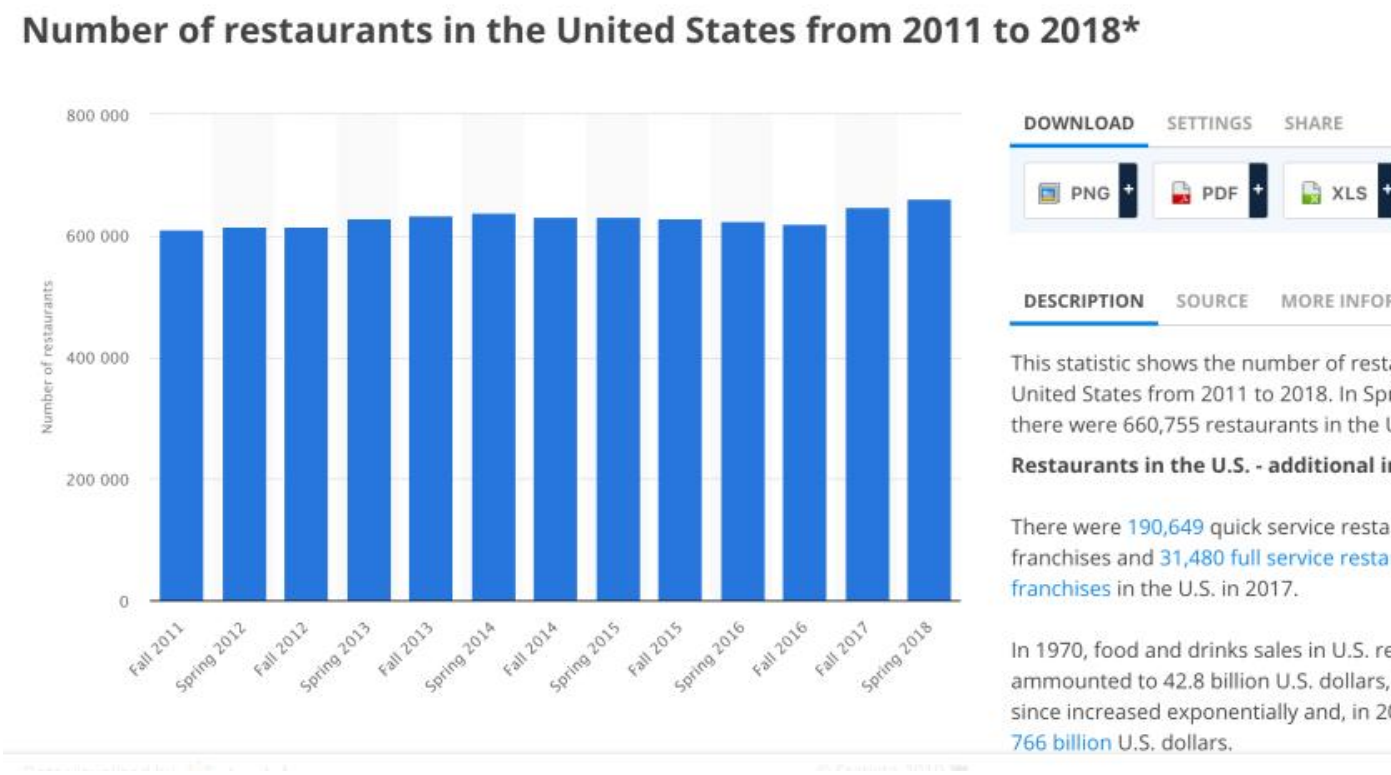
Establishments primarily engaged in manufacturing beverages and tobacco are classified separately in Subsector 312, Beverage and Tobacco Product Manufacturing and are not covered in this chapter.

Current Economic Indicators

The food manufacturing industry is one of the United States' largest manufacturing sectors, accounting for more than 10 percent of all manufacturing shipments. The processed food industry has experienced fairly steady growth over the 1997-2006 period but experienced a slight decline from 2005 to 2006. In 2006, the value of food shipments was $538 billion, an increase of 27 percent from 1997 shipments of $422 billion (see Figure 1).[1] Demand for processed food products tends to be less susceptible to fluctuating economic conditions than other industries.

In 2006, there were 28,000 establishments in food manufacturing. Large multinationals are a big presence in the industry but although they account for 36 percent of all the jobs in the industry, they represent just over 500 of the 28,000 establishments. Eighty nine percent of establishments employ fewer than 100 workers.[2]

There are approximately 661,000 restaurants in the US – most of them serve some variety of meat, poultry, and seafood.



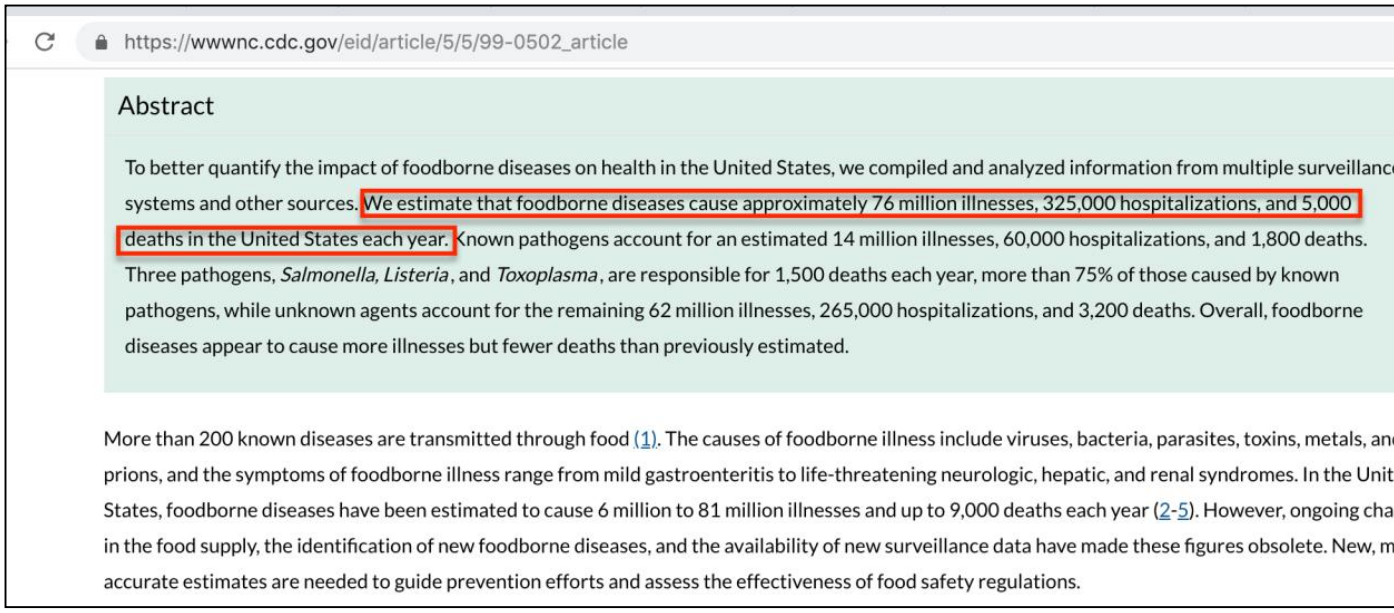
3. Reasons for Traceability

Meat traceability is important for a number of reasons, some of which are 1) Preventing counterfeit and false labeling, 2) Helping consumers make more informed decisions on their food choices, and 3) Helping identify deadly/sickening tainted food quickly after it is identified and removing it from the food supply.

The New York Times

Catfished by a Catfish: 1 in 5 Seafood Samples Is Fake, Report Finds

Twenty percent of seafood samples tested worldwide are different species from what their labels say.
Jenn Hueting/Oceana

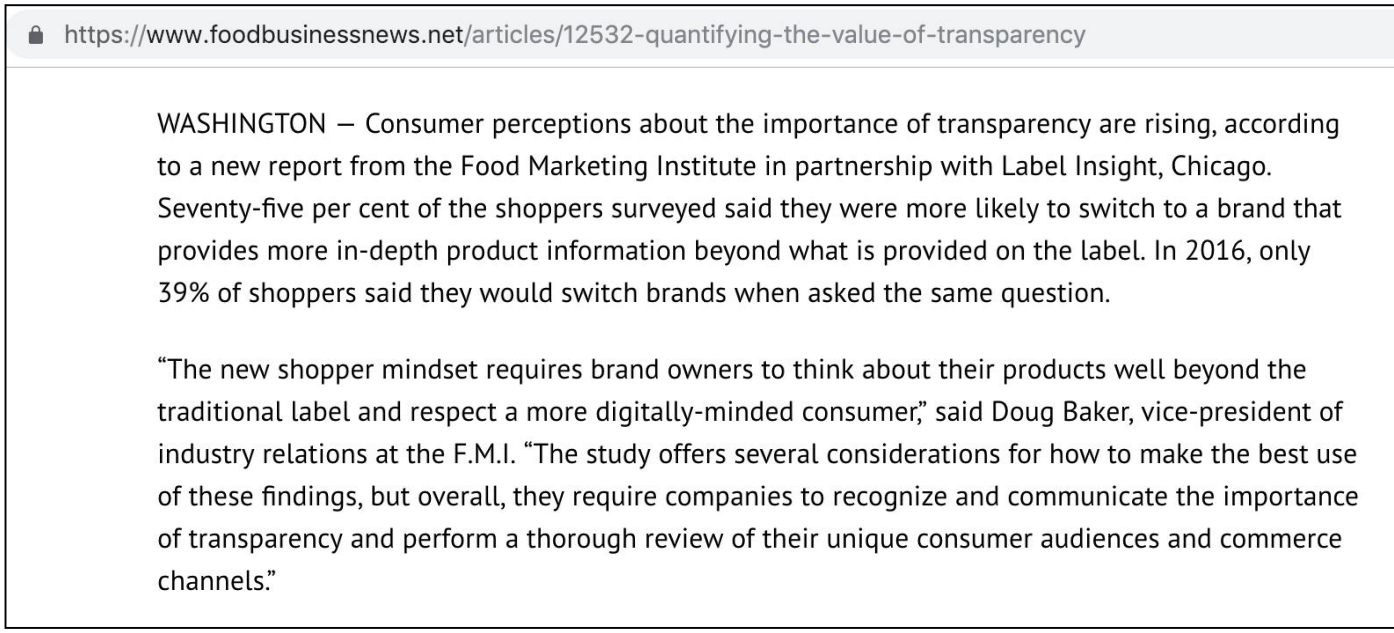


https://wwwnc.cdc.gov/eid/article/5/5/99-0502_article

Abstract

To better quantify the impact of foodborne diseases on health in the United States, we compiled and analyzed information from multiple surveillanc systems and other sources. We estimate that foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the United States each year. Known pathogens account for an estimated 14 million illnesses, 60,000 hospitalizations, and 1,800 deaths. Three pathogens, *Salmonella, Listeria*, and *Toxoplasma*, are responsible for 1,500 deaths each year, more than 75% of those caused by known pathogens, while unknown agents account for the remaining 62 million illnesses, 265,000 hospitalizations, and 3,200 deaths. Overall, foodborne diseases appear to cause more illnesses but fewer deaths than previously estimated.

More than 200 known diseases are transmitted through food (1). The causes of foodborne illness include viruses, bacteria, parasites, toxins, metals, an prions, and the symptoms of foodborne illness range from mild gastroenteritis to life-threatening neurologic, hepatic, and renal syndromes. In the Unit States, foodborne diseases have been estimated to cause 6 million to 81 million illnesses and up to 9,000 deaths each year (2-5). However, ongoing cha in the food supply, the identification of new foodborne diseases, and the availability of new surveillance data have made these figures obsolete. New, m accurate estimates are needed to guide prevention efforts and assess the effectiveness of food safety regulations.



https://www.foodbusinessnews.net/articles/12532-quantifying-the-value-of-transparency

WASHINGTON — Consumer perceptions about the importance of transparency are rising, according to a new report from the Food Marketing Institute in partnership with Label Insight, Chicago. Seventy-five per cent of the shoppers surveyed said they were more likely to switch to a brand that provides more in-depth product information beyond what is provided on the label. In 2016, only 39% of shoppers said they would switch brands when asked the same question.

"The new shopper mindset requires brand owners to think about their products well beyond the traditional label and respect a more digitally-minded consumer," said Doug Baker, vice-president of industry relations at the F.M.I. "The study offers several considerations for how to make the best use of these findings, but overall, they require companies to recognize and communicate the importance of transparency and perform a thorough review of their unique consumer audiences and commerce channels."

4. Meat Traceability Today

The largest meat companies typically have a GS1-128 barcode label on the product label. For example, this label might be the case of lamb loins that went from the slaughterhouse to the meat processing company. When the lamb processing company receives this case into their cut room, they would hopefully record this in the list of raw materials that day when making lamb chops. Then they make a box of lamb chops sold to a local restaurant, they would make a similar looking label with the lot date of the cutting and a new serial number.

This is the best case scenario in today's meat world. More likely however, 75% of the boxes receive from the slaughter facility will be missing important information like the box serial number or even the lot date. When the lot date is not in the barcode, it is typically written with a magic marker on the box. Many processing facilities further down the stream don't even have the ability to print barcode labels – about 50% of these facilities write on the box that is delivered to the customer with just a processing date and weight.

In either situation, the hotel or restaurant or grocery store that receives this processed meat doesn't have much information at all to relay to their end-consumer to make informed decisions. The primary utility is if a consumer becomes ill, they can alert the restaurant, the restaurant can hopefully identify which box of meat is bad and contact their customer with the lot date/box #.

Reasons For Limited Traceability Today

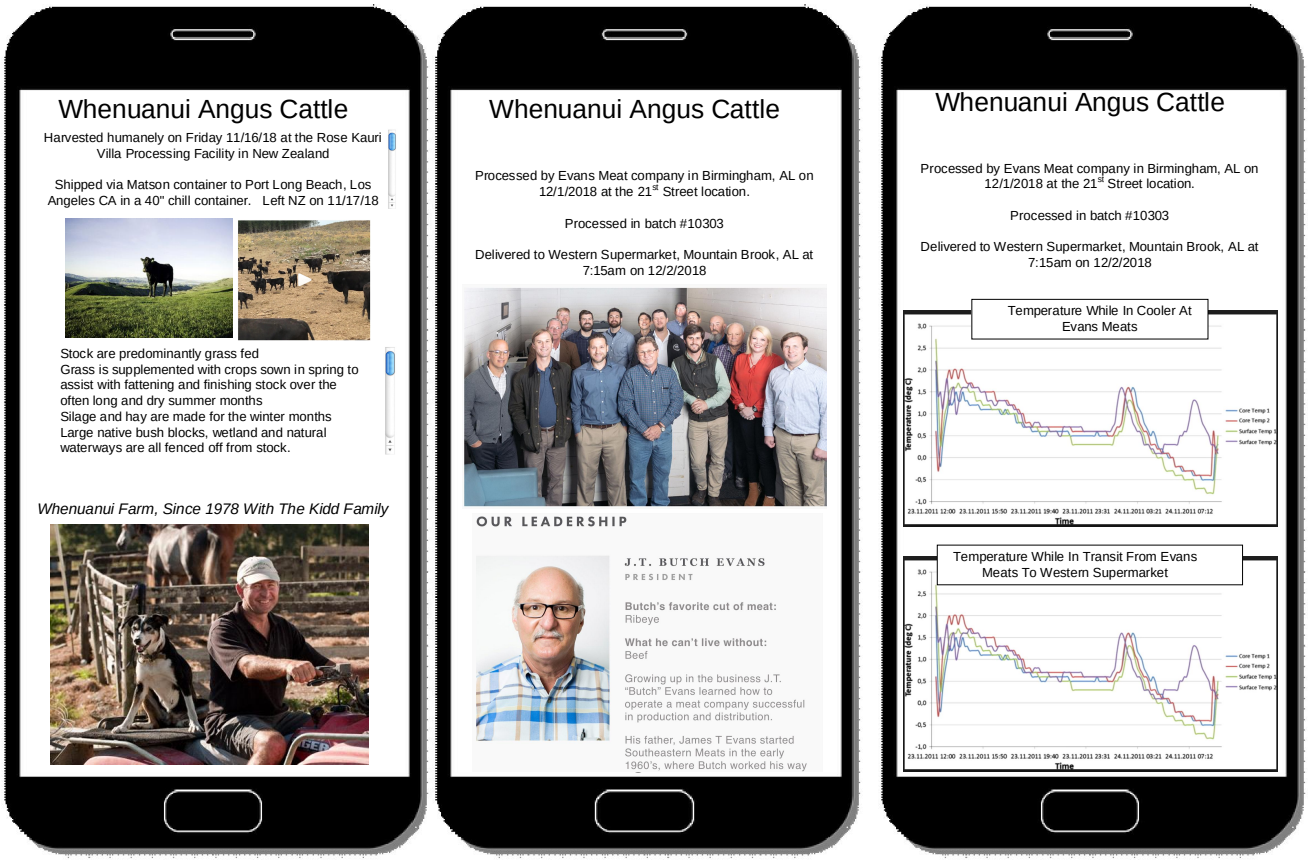
In the meat ecosystem, there are hundreds of thousands of trading partners and very limited requirements for labeling products. Every player simply does as they see fit based on their own desires or requests from their larger customers. Some have great labeling, some have unmarked boxes, some have magic marker labeled boxes.

There is a financial incentive to do the minimum amount of work necessary to please the customers and the government agencies. Are the customers really going to notice if you sell them patties labeled "100% grass-fed hamburger" that you ground from 50 cases of grass-fed beef and 2 cases of a inexpensive, lesser quality beef? If you are selling battered cod loins, you could probably get away with mixing in some lower priced Chinese catfish loins to lower your cost of goods sold.

Interface For a New Traceability Solution

If a consumer stands in a grocery store today and picks up a package of beef fillets, they can only see what the packaging tells them "8oz Grass Fed Beef Fillets, New Zealand", Packed by Bob's Meats on 12/12/18.

In our ideal future, the consumer opens their smart phone app and scans a QR Code on the packaging and that opens a browser that shows a plethora of information about where that specific beef came from. If the package of fillets had four different tenderloins in it that came from two possible ranches in that day's processing, the barcode scan would show a table with both ranches and the user would tap on each one to display the information.



5. Incentive to Utilize The Traceability System

Meatblock.io is creating a Blockchain Utility Token on the decentralized Tron network to incentivize the players in the meat/seafood/poultry ecosystem and consistently track the movement of the products; thus providing valuable information to the end-users and to the producers.

Rancher raises cattle – when tag is put on, a unique "coin" is created on the blockchain associated with just that one animal. Additional information is stored on the blockchain with pictures, grazing records, health records, etc – only the Rancher can update the info on the blockchain for this single "coin".

When the animal goes to slaughter and comes out in primal or subprimal pieces, the information is stored on the blockchain and control is passed from the rancher to the slaughter/initial processing facility. From there, the facility records the weights of all the pieces and ties them back to animal; the old "coins" are closed out and new "coins" are created for each box. Additional information in stored on the blockchain such as SSOP cleanup procedures, temperature logs, HACCP Plans, etc.

When the subprimal pieces are sold to a meat processing wholesaler, they receive each case of subprimal meat and mark that "coin" off the blockchain if they process it into cut steaks. They create a new "coin" on the blockchain for the case of cut steaks that they sell to a restaurant or grocery store. The grocery consumer or chef can then scan the label on the box and view the information all of the way back to the animals at the ranch.

Using an escrow style blockchain contract, the initial sale of the animal from the ranch can include a certain $ per pound that is recoverable after the product makes its way from the rancher to the end-user. If a majority of the product ends up in the right hands and trackable the entire way, it will trigger the contract for the ranch to credit money back to the entire supply chain for doing their job properly. The rancher can then justify charging more for their product and the rancher can see exactly where their product is going, how it is being handled, and also ensure that it is not being falsely labeled. If any one player drops the ball, nobody gets paid the "bill-back"; thus everyone is incentivized to do the right thing.

6. Traceability Technology Building Blocks

Blockchain technology was invented by Satoshi Nakamoto in 2009 in his groundbreaking invention of Bitcoin. Blockchain is a distributed digital ledger technology that allows tamperproof and trusted transactions without a third party. It is also very resistant to censorship.

IPFS (Inter-Planetary File System) was developed in 2014 by Juan Benet; it evolved from the Bitcoin blockchain as a way of storing files of any size in a way that is tamperproof and very resistant to censorship.

Ethereum Blockchain technology was invented in 2015 by Lubin/Wood/Buterin; the main innovation on Bitcoin was that it allowed the creation of distributed trustless contracts and distributed trustless apps which run on the Blockchain and can execute programs and contracts without a third party. Ethereum is also very resistant to tampering and censorship.

Tron Blockchain technology was invented in 2018 by Justin Sun; it evolved from the Ethereum project. The main innovation on Ethereum is that it relies upon a unique Proof Of Stake technology which allows the network to be decentralized but still process transactions/programs/contracts at a much faster rate than Ethereum. It is also very inexpensive for parties to use when compared to Ethereum.

Meatblock.io technology is being built upon the Tron and IPFS technology in 2019 to enable the disparate parties in the meat/poultry/seafood ecosystem to pass traceability data to eachother in a trustless, tamperproof way.

7. Interoperability With Existing Technology

The label technology designed by Meatblock.io satisfy the requirements for full backward and forward traceability is 100% compatible with existing GS1-128 labels that are commonly in use today. It is expected that higher end meat/poultry/seafood brands would be the first to embrace the technology and then coax their suppliers to push the data further downstream.