

Traditional Soyfoods - Coming Of Age in 21st Century

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Objectives

- Review the history of traditional soyfoods
- Describe the steps in manufacturing traditional soyfoods
- Present sales figures and new versions of traditional soyfoods



Biography of Soy

- Beginnings in China
 - Domesticated around fifteenth century B.C.
 - Called *sou*
 - Invention of tofu in 220 AD lead to spread of soy consumption around country
- Spreads in Japan
 - Brought by Buddhists monks
 - Quickly became common food



Soy Spreads to the West

- Brought into Europe in 1700's
- Mention of soymilk in 1896 in American Journal of Pharmacy
- Soyfoods begin in US in 1970's with
 - Vitasoy Hong Kong introduces soymilk
 - Dr. John Harvey Kellogg introduces soymilk
 - Seventh Day Adventists



Customer Base for Traditional Soyfoods Expands

- Asian American population continues to double.
- Vegetarians and partial vegetarians on the rise.
- Lactose intolerance is a problem for many.
- Some baby boomers interested in longevity and good health.
- More individuals are seeking natural and organic type foods.



Starting with the Bean



- Fresh soybeans
 - similar in size and color to peas
 - harvested in early July
- Mature soybeans
 - yellow-beige color
 - harvested in late September or early October

Products Made from the Whole Bean



- Edamame/soy sprouts
- Soynuts
- Whole fat soy flour
- Soymilk
- Tofu
- Yuba
- Miso/natto/tempeh
- Soy sauce

Edamame



Handling Soybeans

- Soybeans arrive by bag or bulk and separated by organic or non-organic.
- Raw materials that may contain bacteria & dirt should be kept outside production area.



Preparing Soybeans



- Soybeans cleaned and dehulled before soaking.
- To reduce risk of contamination, bean cleaning is done outside of the processing area.

Soaking Soybeans



- Soybeans are washed and then soaked in warm or cold water and alkaline added for some, depending on the processing needs.
- Soaking water is drained and beans are rinsed again.

Washing Soybeans



- Soaked soybeans undergo additional washing prior to the grinding stage.

Grinding the soybeans



- The soaked beans are ground with either hot or cold water to form a slurry.
- The slurry is standardized to a specific water to bean ration and pumped to the cooking station

Cooking Ground Soybean Slurry



- The soybean slurry is about 10:1, water:beans.
- Cooking temperatures vary from 82° C-154°C
- Time varies from 30 seconds - 20 minutes.
- Cooking is in steam injected cookers, at high pressure.

Removing the “Okara”



- The “okara” or soybean pulp is removed with a roller extractor or horizontal decanter.
- Okara may be flavored and packaged or made into burgers.

Soy milk Beverages

- Sales up 19.2% from 2000 to \$550 million in 2001
- Sales were \$84 million in 1992
- 305 soymilk beverages in 2002
- Refrigerated soymilk has 61.2% of market share



Soy milk Processing Methods

Process	Tradition	Cornell	Illinois	RHHC	ProSoya
	SOYBEANS ↓ SOAK ↓ COLD GRIND ↓ ↓ COOK 100° C FILTER 20 MIN ↓ ↓ FILTERCOOK	SOYBEANS ↓ SOAK ↓ HOT GRIND ↓ COOK 100° C 10 MIN ↓ FILTER	SOYBEANS ↓ ALKALINE SOAK ↓ BLANCH ↓ GRIND ↓ COOK TO 82° C ↓ HOMO	SOYBEANS ↓ GRIND TO FLOUR ↓ SLURRY IN WATER ↓ COOK 154 C 30 SEC ↓ COOL ↓ FILTER	SOYBEANS ↓ SOAK ↓ COLD GRIND IN WATER WITHOUT OXYGEN ↓ COOK 100° C 10-20 MIN ↓ FILTER
BEANY FLAVOR	STRONG	IMPROVED	NONE	NONE	NONE
SOLIDS YIELD	55-65%	65%	89%	86%	75%
PROTEIN YIELD	70-80%	83%	95%	90%	80%

Data from Soyatech, Inc

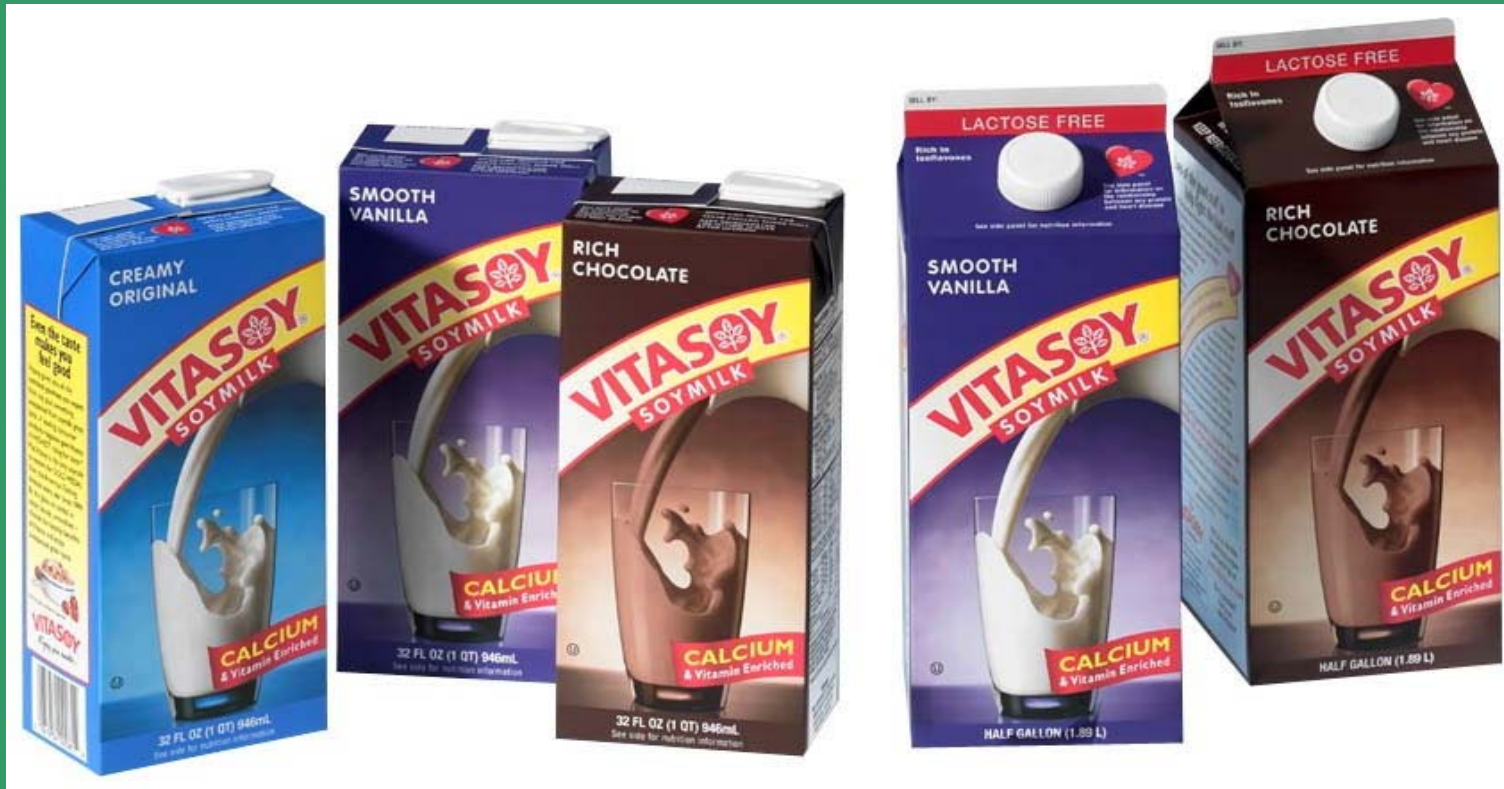


Modified Nutritionally

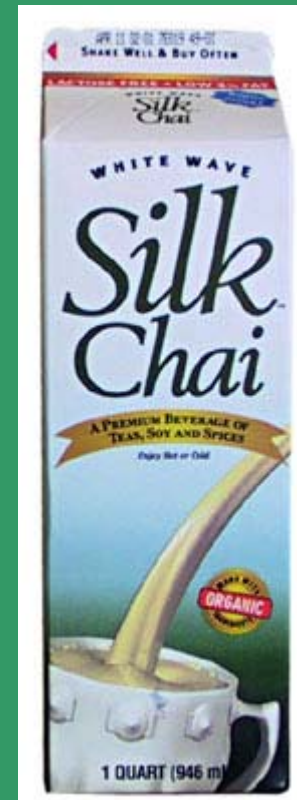


Soymilks are now available non-fat, unsweetened, and low fat.

Versatile Packaging



New flavored soy beverages



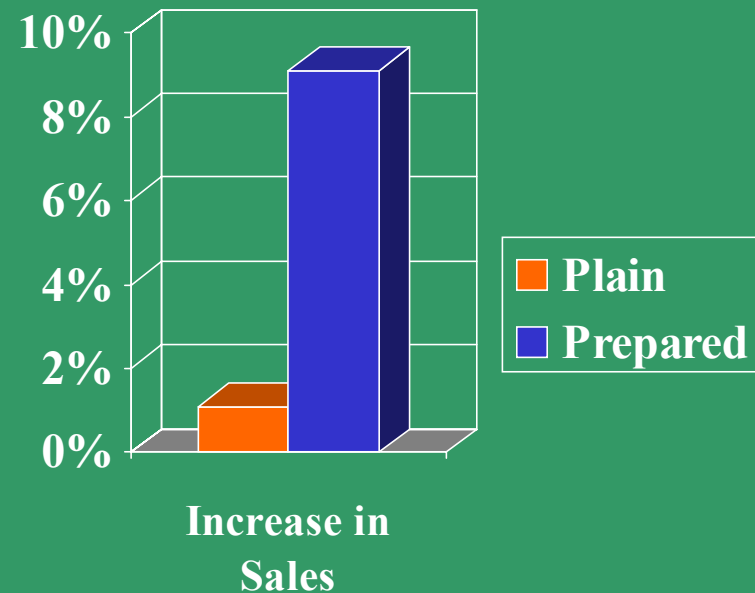
New Packaging



Tofu

- Sales up 2.7% to \$243 million in 2001, up from \$100 m in 1992
- 231 tofu products on market in 2002
- Most tofu sold in refrigerated water-filled tubs
- Prepared tofu accounts for 20.7% of market

Tofu Sales 2001
Plain vs. Prepared



Adding Coagulant to Soymilk



- After the okara is removed, the hot soymilk is pumped to curdling barrels.
- A coagulant such as calcium chloride or magnesium sulfate is added to soymilk.
- After 15 - 20 minutes, the soymilk is curdled.

Forming the Curds



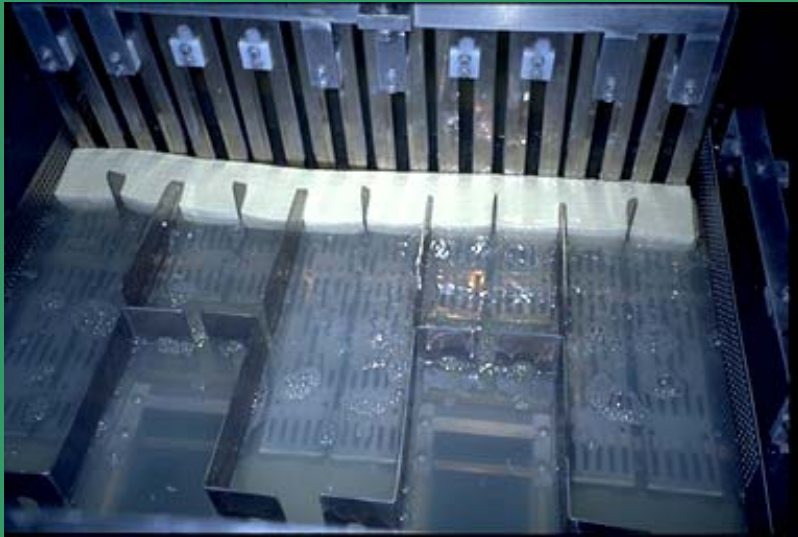
- The hot curds are dumped from curding barrel into the cheese cloth-lined forming box and the whey is drained off.
- The curds are distributed evenly and lid placed on top.

Pressing the Curds



- A hydraulic press pushes down the lids as the forming boxes move down the production line.

Cutting the Tofu



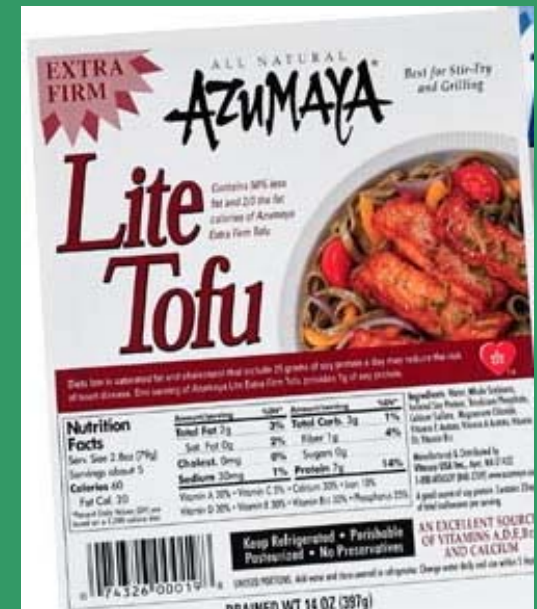
- After pressing, the large block of pressed soybean or tofu is lowered into cooling water.
- A machine cutter cuts the large tofu blocks underwater into defined cubes.

Packaging the Tofu



- The tofu cubes are inserted into plastic trays that are filled with clean water.
- A plastic film is applied on top to seal the packages.

Various Versions of Tofu



Available in marinated, smoked, baked, and low fat.



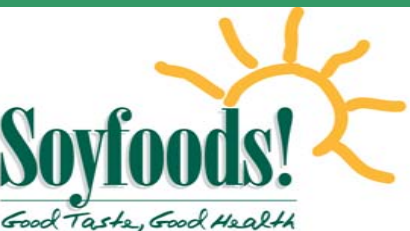
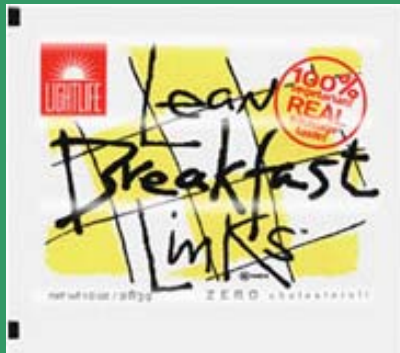
New Tofu Packaging



Conveniently Packaged Tofu



Tofu-based Products



Miso

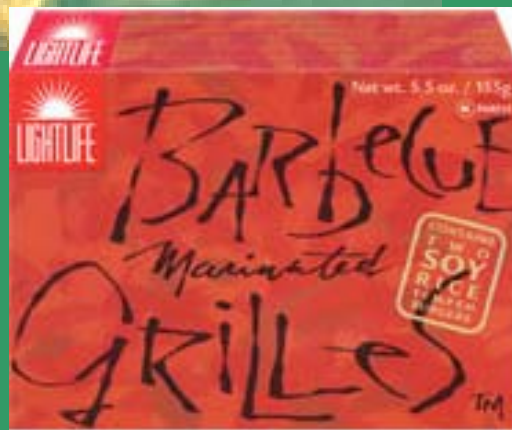


- Fermented soybean paste
- Made from soybeans and a grain (rice or barley)
- Combined with a salt and a mold culture
- Stored in cedar vats and aged one to three years

Tempeh



- Cooked whole soybeans and grain combined is fermented with mold culture.
- Incubated at a warm temperature for 18-24 hours



Yuba



- Yuba is the coagulated soy protein which is formed on the top of simmering hot soymilk
- The “sin” is removed from the soymilk, dried and packaged for Chinese cuisine.

Traditional Soyfoods are Versatile

- Traditional soyfoods have improved through new processing techniques to meet the flavor and convenience preferences of consumers.
- For more info, check www.soyfoods.org.






Resources at Your Finger Tips

SANA WEBSITE

www.soyfoods.org

Make the website of the Soyfoods Association of North America part of your daily menu. For facts, figures, and food ideas about soyfoods - check www.soyfoods.org

- Current Events 
- In The News 
- Soyfood Facts 
- Locating Soy Products 