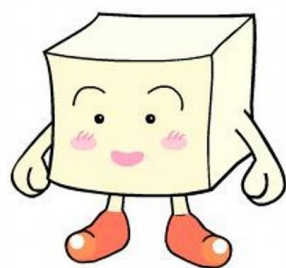


28 June 2023

 SOY.ORG



WHAT JAPAN LOOK FOR IN SOYBEAN FOR TOFU MAKING

~Toward a revolution in Tofu. The Sustainability Challenge~

日本の豆腐業界が大豆に求めるもの
~豆腐(TOFU)の変革に向けて~

Japan Tofu Association 日本豆腐協会
Chairman Kenji Miyoshi 会長 三好 兼治

U.S. SOY FOR A GROWING WORLD



AGENDA 目次

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| 1. About JTA and raw materials | 日豆協と原料について |
| 2. Characteristics of Japanese tofu culture and future | 日本の豆腐文化の特徴と未来 |
| 2. Specs required for soybeans | 大豆にもとめる適性 |
| 3. Tofu test production | 豆腐の加工適性テスト |
| 4. Tour of the U.S. 2022 Aug | 昨年の米国研修 |
| 5. Tofu Future Project | 日米大豆研究会のビジョン |

NAME	JAPAN TOFU ASSOCIATION
CHAIRMAN	Kenji Miyoshi
MEMBER	25 Manufacturers 26 Supporting Members
ESTABLISHMENT	December 1976
LOCATION	Tokyo, Japan
ACTIVITY	<ul style="list-style-type: none"> • Education and training on tofu production technology, raw soybean, quality, distribution and the environment • Development of a manual on 'Building a Tofu Safety Assurance System' incorporating the HACCP method • Work on guidelines on tofu containers & packaging



USSEC TOFU TEAM TO U.S.A		
Year	Month	# of Members
2016	June	2
2019	Aug	2
2022	Aug	11

NAME	JAPAN TOFU ASSOCIATION
CHAIRMAN	Kenji Miyoshi
MEMBER	正会員 25 賛助会員 26
ESTABLISHMENT	December 1976
LOCATION	Tokyo, Japan
ACTIVITY	<ul style="list-style-type: none"> 豆腐の原料大豆、製造技術、品質、流通、環境に関する教育、研修を行い、HACCP手法を取り入れた「豆腐安全確保システム構築」マニュアルの作成、豆腐の容器包装についてのガイドライン作成等の事業を行う。



USSEC TOFU TEAM TO U.S.A

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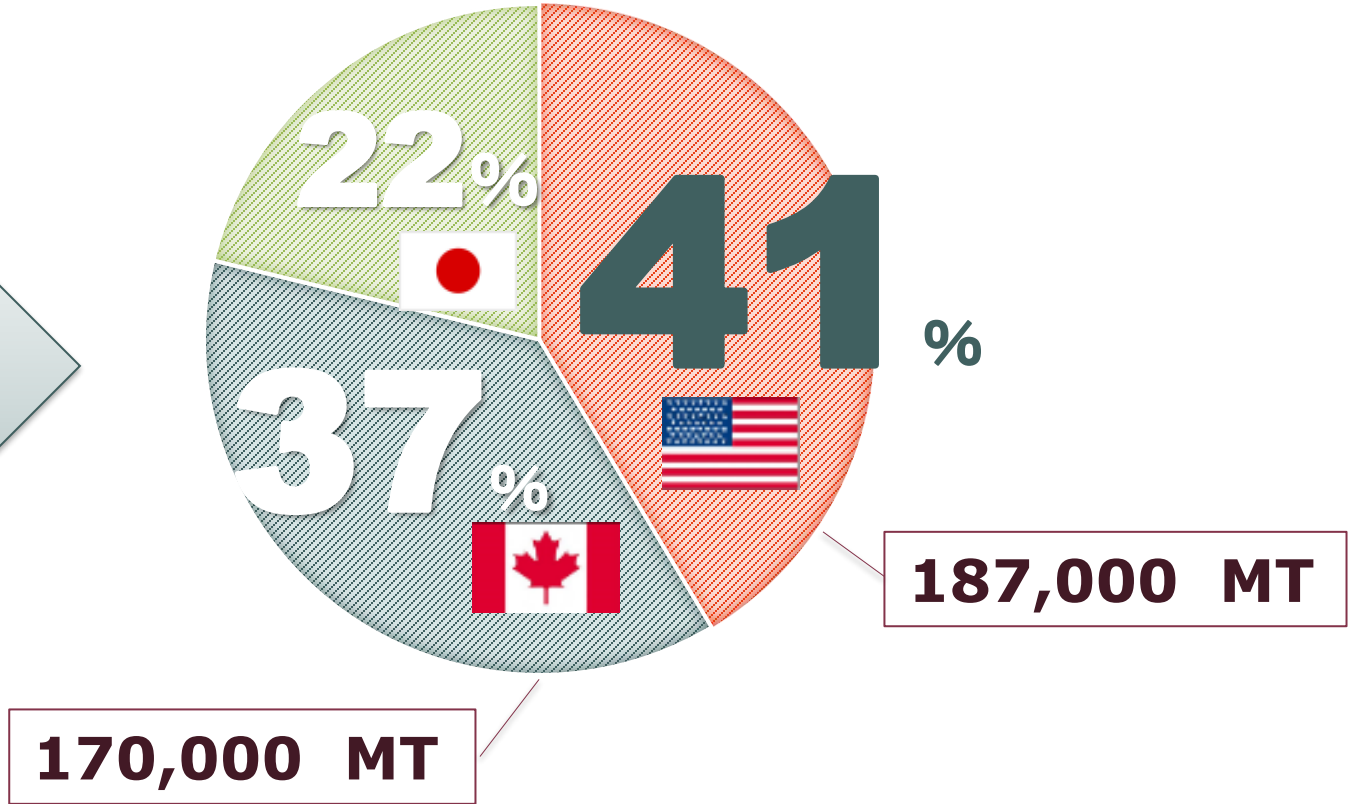
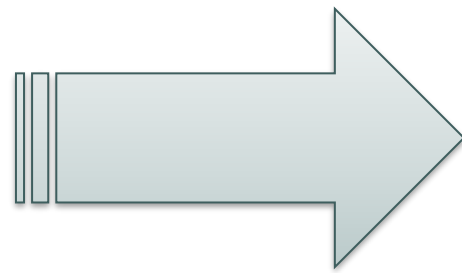
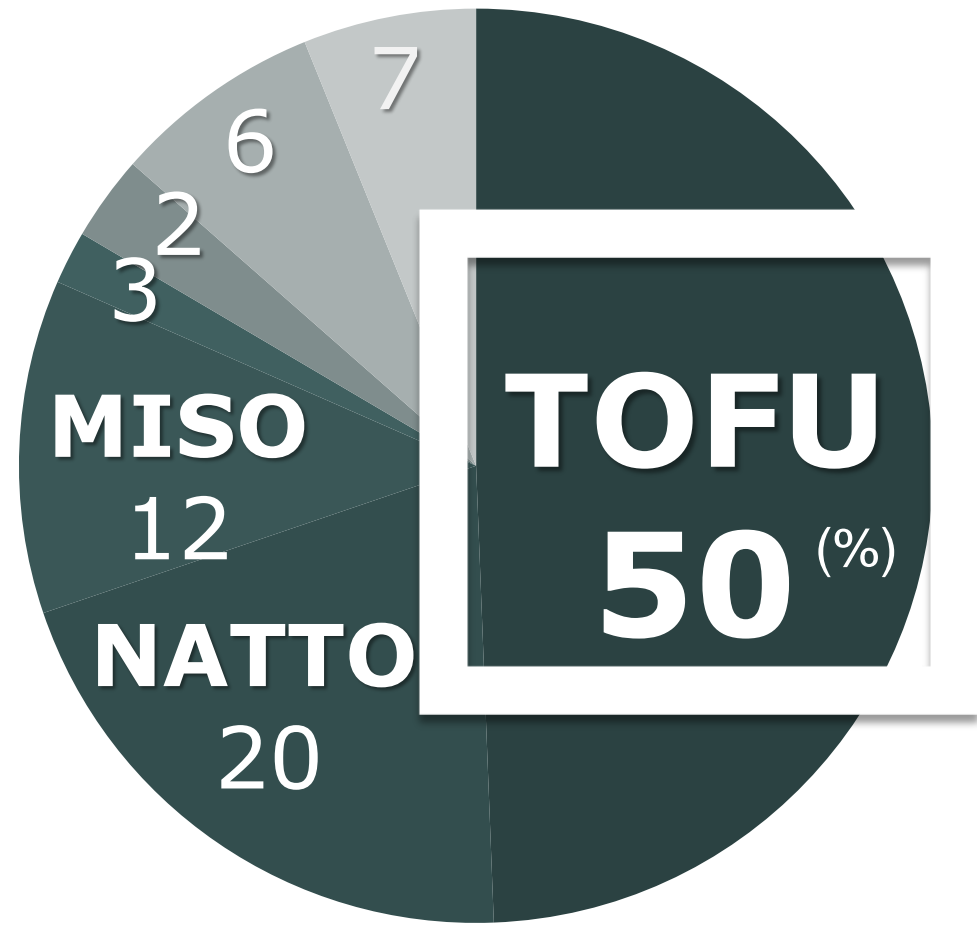
Japan Food Bean Demand and Tofu Bean Origins

日本の食品大豆の需要と
豆腐の原料大豆

TOFU

TOTAL 932TMT

TOTAL 475,000 MT



日本の豆腐文化の特徴

Diversity:

- Wide range of varieties
- Different shapes and preferences in different regions
- Momen, silken, packed-silken, oboro (unpressed), zaru (tofu in bamboo basket), thick fried tofu, deep fried tofu, frozen tofu, various degrees of firmness

Numbers of Companies:

- Many manufacturers

	# Total	> 4 persons
2001	15,028	2,701
2010	9,881	1,625
2020	5,319	641



Source: number of Tofu production licenses , Ministry of Health, Labor and Welfare economic census, Ministry of Economy, Trade and Industry

日本の豆腐文化の特徴と未来



TO FUTURE

- Product diversification continues
- The varieties used by the companies were different and there was no sense of uniformity, but this is being consolidated to some extent as the # of companies decrease (become larger)

日本の豆腐文化の特徴と未来

多様性

- 豊富な種類
- 地域によって違う形状や嗜好

木綿、絹ごし、充填絹ごし、おぼろ、ざる、厚揚げ、油揚げ、凍り豆腐、いろいろな硬さ等。

企業数

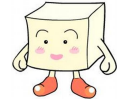
- 多くの豆腐製造業者

	製造許可数	4人以上
2001年	15028	2701
2010年	9881	1742
2020年	5319	641

※厚生労働省 豆腐製造許可数 と 経済産業省工業統計より



- 商品の多様化は継続。
- 各社とも使用する品種がバラバラだったが、企業数の減少(大規模化)とともにある程度集約していく。



Absolute Conditions:

1. Soybean farmers' production yield come first
2. Protein content and quality (11S/7S ratio)

絶対条件:

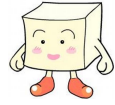
- 1.大豆農家の単収が第一
- 2.タンパク質の含有量と質 (11S/7S比)

Other Condition:

- ・ A certain # of tofu producers would insist on white or clear hilum due to value-added production of okara used in confectionery & baked goods (for no black spots to be mixed in)

他条件:

おから利用を付加価値製品化しているため白目にこだわるメーカーが一定数存在する



glycinin
グリシニン



β-conglycinin
βコングリシニン

- Two are the main components of protein
- The more 11s, the more particle protein, the harder the tofu become
- The more 11s-Rich the tofu is, the harder it becomes, even at low coagulant concentrations

- 2つはタンパクの主成分
- 11sが多いほど粒子タンパクが多く豆腐が硬くなる
- 11s Richは低い凝固剤濃度でも豆腐が固まる

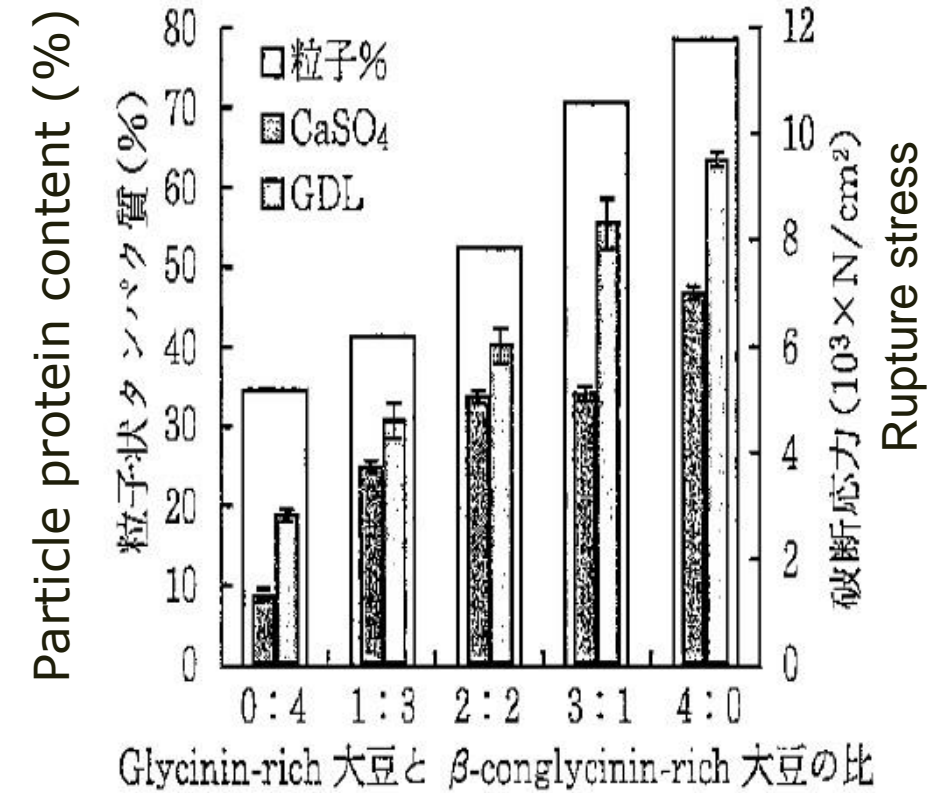


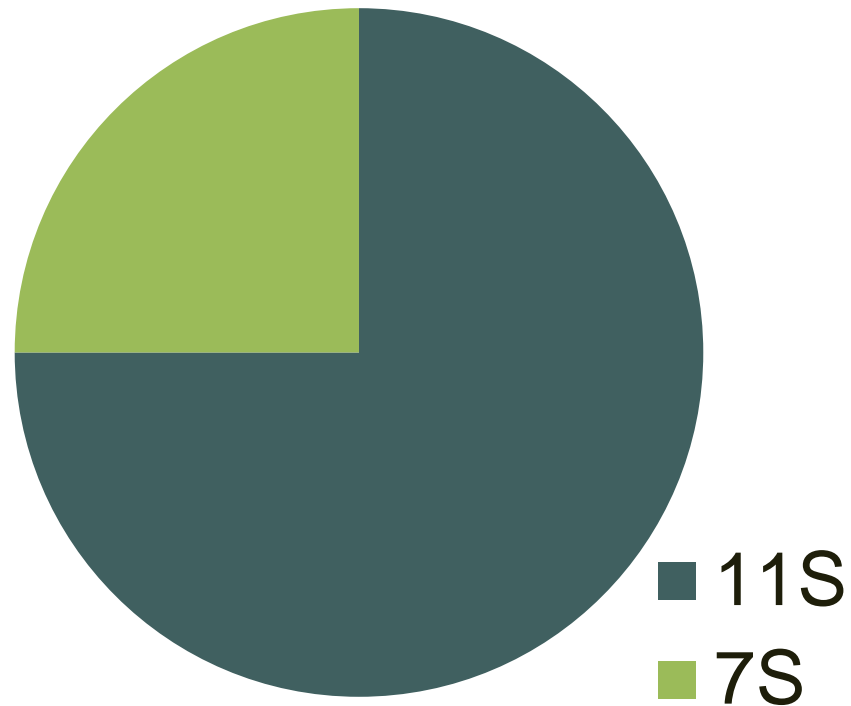
図6.17 豆乳中11S/7S比に対する粒子タンパク質量および形成した豆腐の硬さ⁶⁾

Particle protein content and hardness of the formed tofu relative to the 11S/7S ratio in tofu

Is high protein essential?

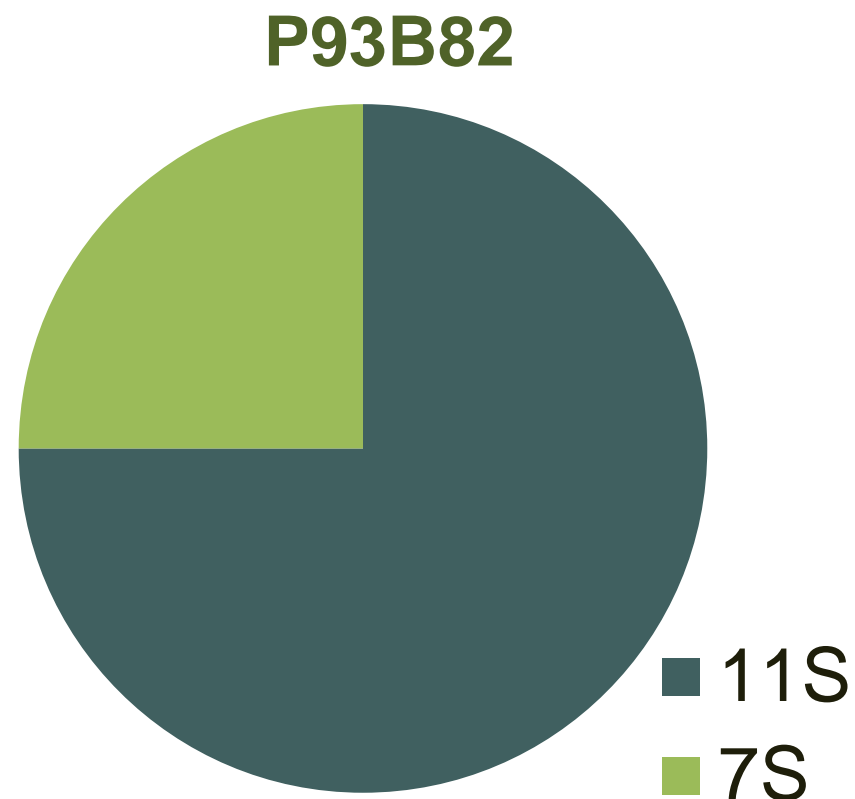
What is the ideal ratio of 11S/7S?

P93B82

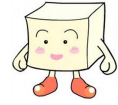


- ✓ High protein is not enough
- ✓ Above 41.5%
- ✓ Common ratio is 2-2.2
- ✓ Popular domestic tofu variety is 1.9-2
- ✓ P93B82 is 3 E3520 is 2
- ✓ 7S, 11S differ in water retention in tofu
- ✓ Analysis method: Electrophoresis method

高タンパクは必須？ 11S/7S の理想比率は？



- ✓ 高タンパクであれば良いのではない
- ✓ 最低限必要なタンパク量は41.5%以上
- ✓ 一般的に多い比率は2-2.2
- ✓ 人気の国産豆腐用品種は1.9-2
- ✓ P93B82は3 E3520は2
- ✓ 7S,11Sで豆腐の保水性が違う
- ✓ 分析方法: 電気泳動法



High yield

41.5% minimum

11S/7S

Next Generation Development Project Challenges in further maximizing U.S. soy

- Many Japanese tofu manufacturers believe: "There may be many varieties of U.S. soybeans, but there are no clear-hilum variety for tofu available from any supplier. Canada has some (e.g. S07-M8)."
- Few owners delve into the characteristics of soybeans on the Japanese side, leaving it to the trading companies to do the research & procurement
- Global logistics disruption and rapid changes in exchange rates and market conditions due to the Covid-19
- Proper education for Next Gen s a challenge

次世代育成を目的にしたプロジェクト アメリカ大豆を買うにあたっての課題点

- 『米国大豆は品種多いかもしれないが、どのサプライヤーからも買える豆腐用白目大豆がない。カナダにはある(S07-M8など)。』・・・と多くの日本の豆腐メーカーが考えている
- 商社に任せ日本側に大豆の特性まで掘り下げて研究している経営者が少ない
- コロナ禍での世界的な物流の乱れと急激な為替や相場環境等の変化
- きちんとした次世代育成が課題



Point

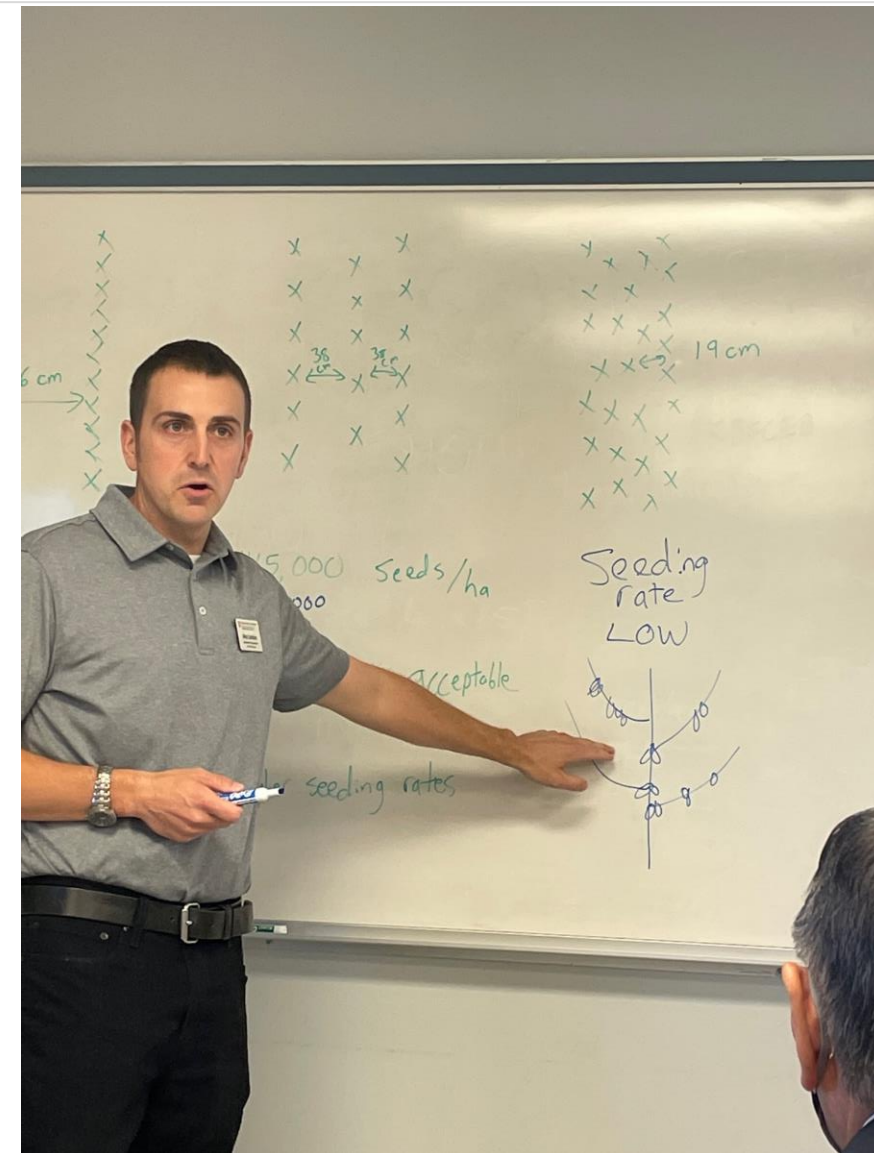
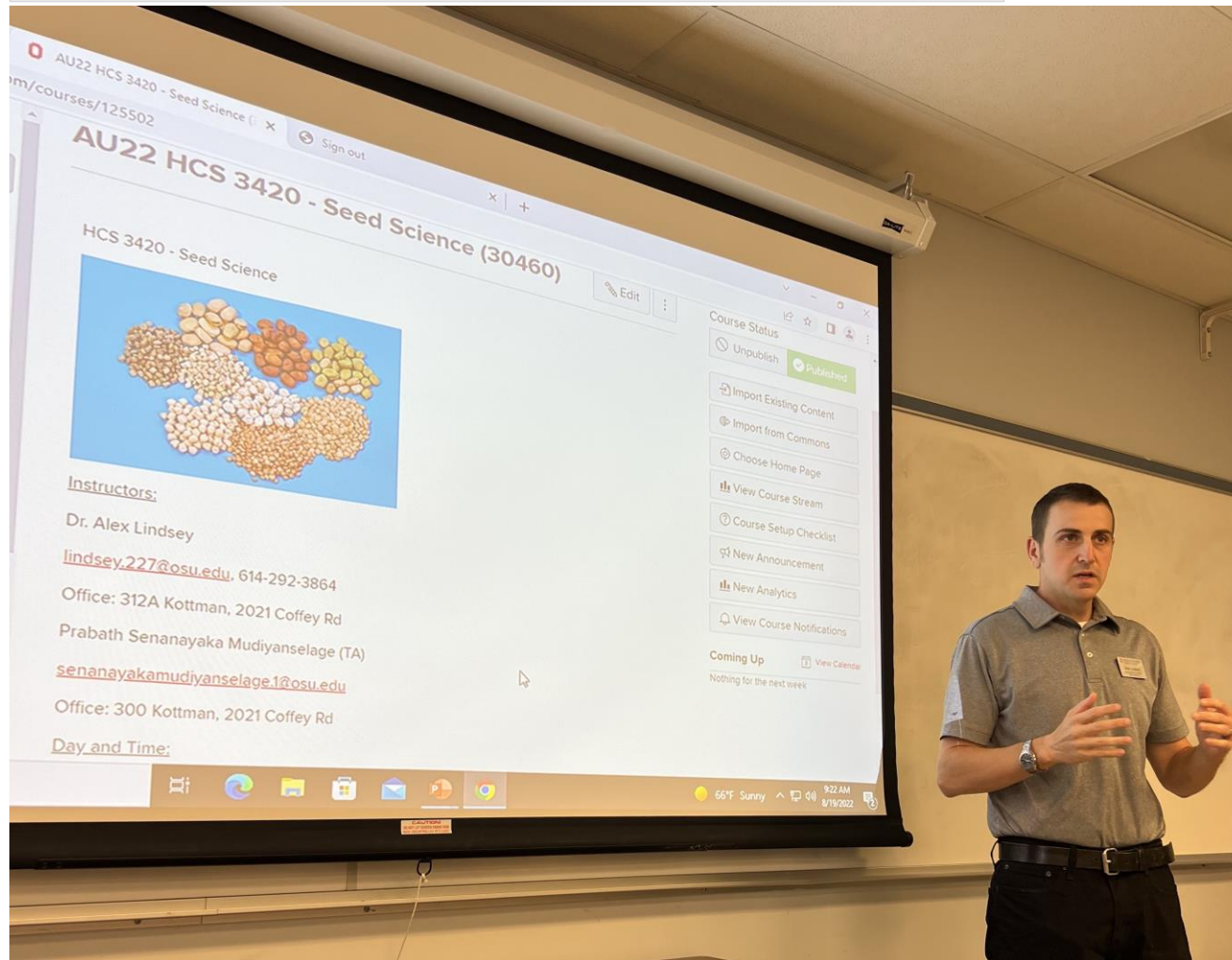
- Hardness and Texture are important
- Looking at the chemical reaction of the soy and the coagulant may lead to the development of more customized variety
- Japan Tofu Association has a platform tofu variety and suitability can be tested

ポイント

- 豆腐の硬さとテクスチャー
- 凝固剤と大豆との化学反応を見て行くことでよりカスタマイズされた品種開発につながるかもしれない
- 日豆協は豆腐向けの品種の豆腐適性テストを行い評価することが可能
(穀物検定協会に構築済)

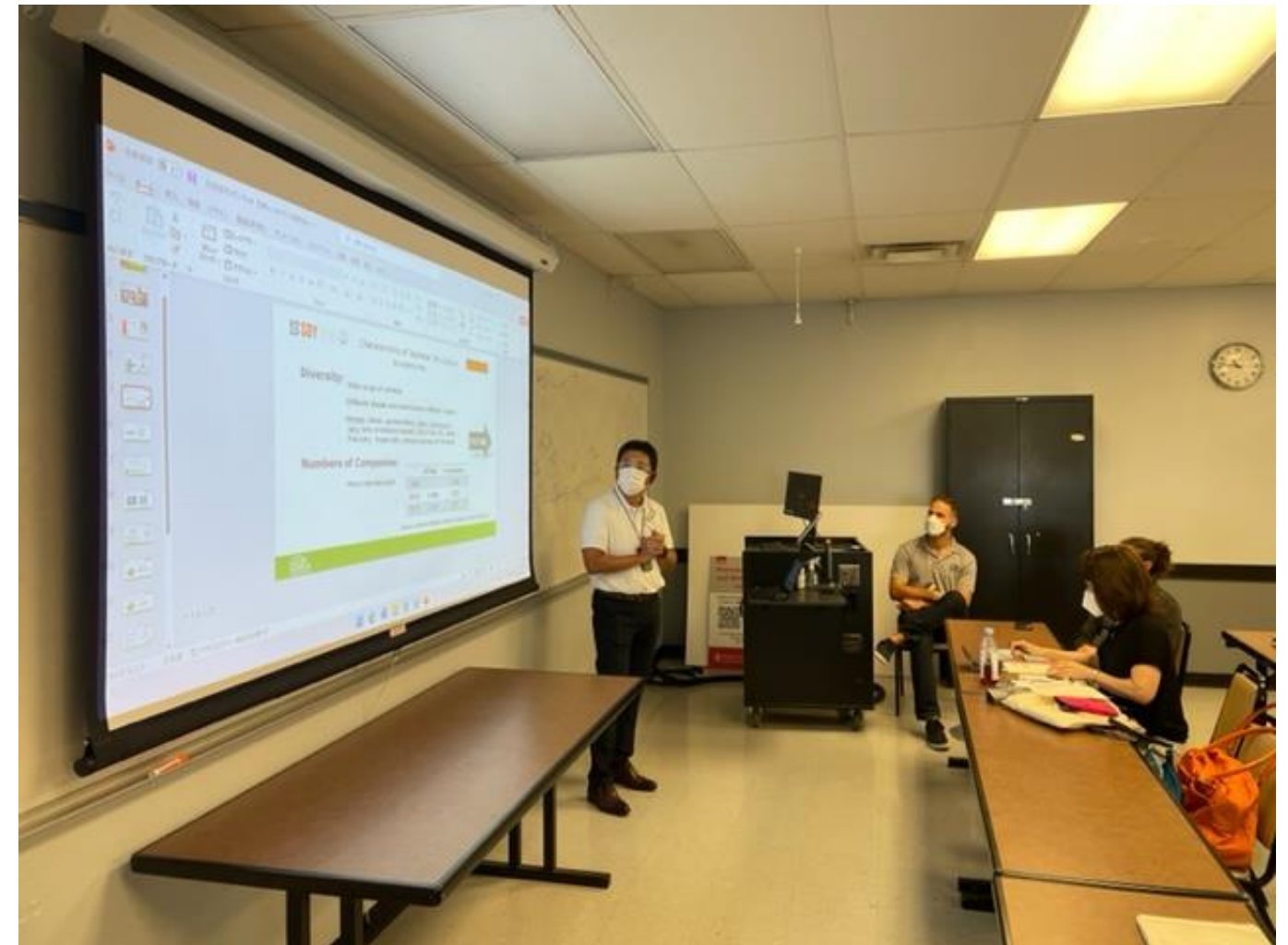
米国視察 Tour of the U.S. 2022 Aug

①オハイオ州立大学での情報交換会



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②オハイオ州シュワルツ農場の視察



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②オハイオ州シュワルツ農場の視察



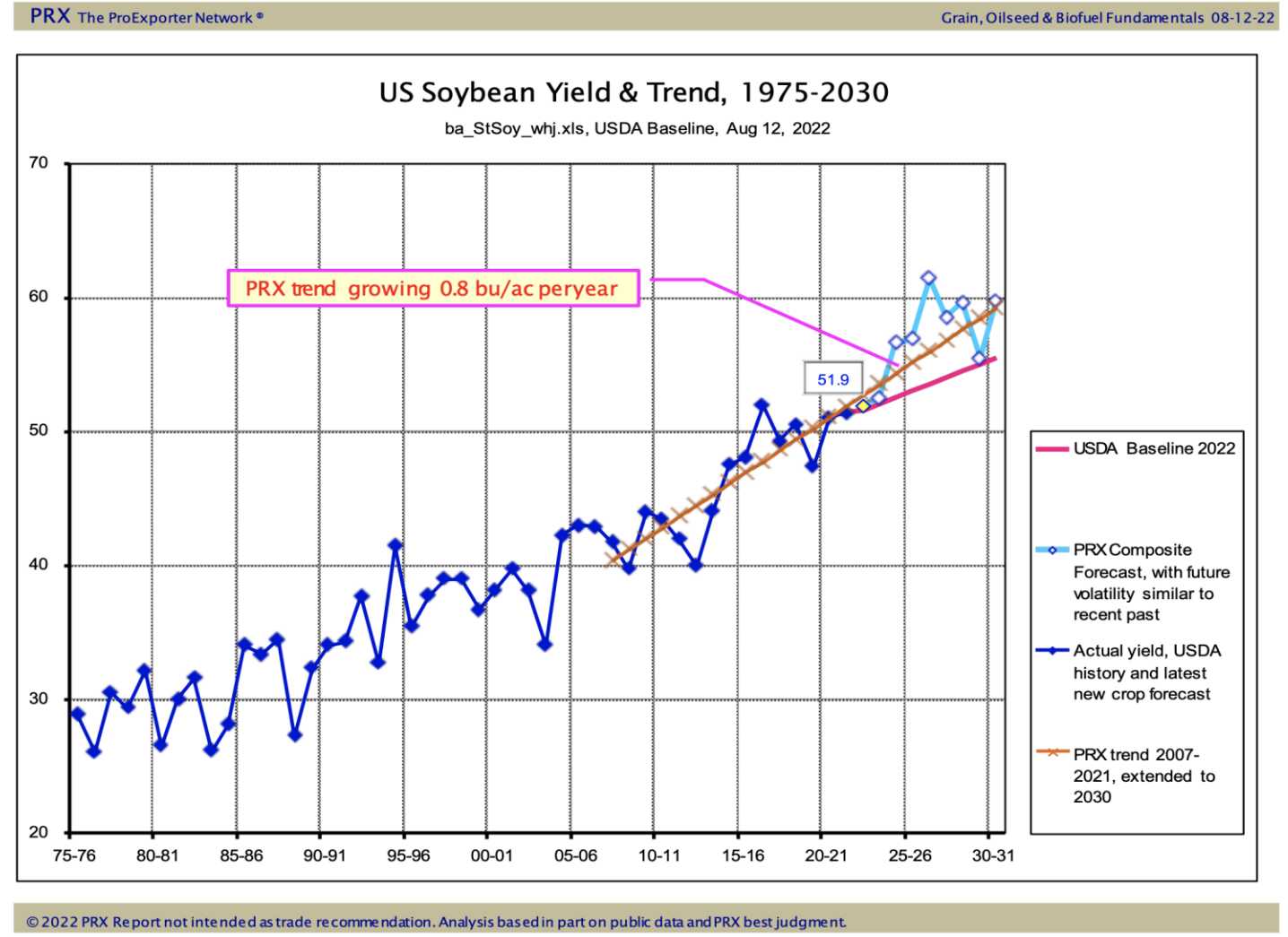
米国視察 Tour of the U.S. 2022 Aug

③SOYCONEXTへの参加



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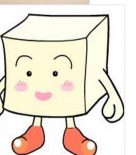
MISSION

Creating a platform for stable procurement of the best U.S. soybean variety for tofu production

- Collaborate with the supply chain of seeds companies and universities, accumulate data on which varieties have which characteristics and the ability to evaluate them, and search for ideal varieties more quickly with the awareness of "Science of Tofu"
→ USSEC's U.S. soy database is also utilized
- To increase the value and trust in Japanese tofu by widely communicating both domestically and internationally that the U.S. soy used in Japanese tofu are sustainably produced and developed by farmers and seed developers with the next generation and the global environment in mind
→ Promote the use of the USSEC's (SSAP) mark and improve the brand value of the association's member manufacturers.
→ Establish a sustainable win-win relationship between U.S. soy and Japanese tofu



VISION





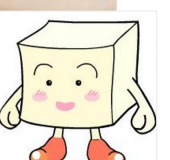
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豆腐づくりに最適なアメリカ大豆を安定的に調達する仕組みづくり

- 種子・大学等のサプライチェーンとも連携し、どの品種がどんな特性を持っているのかというデータとそれ評価する力を蓄え、「豆腐をで科学する」という意識を持ってよりスピーディーに理想の品種を探す → USSECのアメリカ大豆の品種データベースも活用
- 日本の豆腐に使用するアメリカ大豆が『農家や種子開発者が次世代や地球環境を考え、サステナブルに生産・開発された原料であること』を国内外に広く発信し、日本の豆腐への価値・信頼を高めていく
 - USSEC策定のサステナビリティ認証(SSAP)マークの活用を促進し協会員メーカーのブランド価値向上を目指す
 - アメリカ大豆と日本の豆腐のサステナブルWin-Win関係を構築



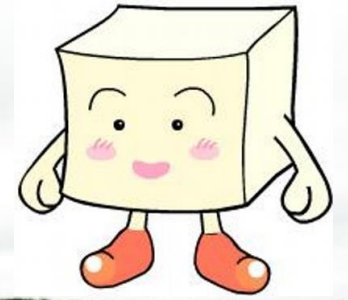
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