

# Agriculture in Japan



Kira Macmillan, Daren Mandrusiak, Scott  
Dunn

# Plant Agriculture



# Takii Plant Breeding Station



## ☞ “Breeding by Design”

- ☞ Create new varieties of flowers and vegetables using genetic marker selection
- ☞ Select for disease resistance, higher nutritional quality, and climate suitability



- ❧ Classical breeding techniques – No transgenics used
  - ❧ Bad perception of GMO from consumers
  - ❧ Japanese consumers value natural products
  
- ❧ Seeds are sold in different parts of the world
  - ❧ Well suited for greenhouse production
  - ❧ Meets the need of each region they supply to
  - ❧ Strains to cope with climate change



# In Canada...



- There are few seed breeders
  - Most of our seeds supplied by European breeders
- Most of our vegetables are also imported because of the cold climate

- ❧ We use genetic marker selection and transgenics in production
  - ❧ For disease and pest resistance



# Spread



# Spread



- 20, 000 lettuce heads per day
- 7.3 million heads per year
- 40-50 days to harvest
- 3 shelves per floor with 4 floors
- 20% price increase from traditional method product
- 30% of production costs is electricity





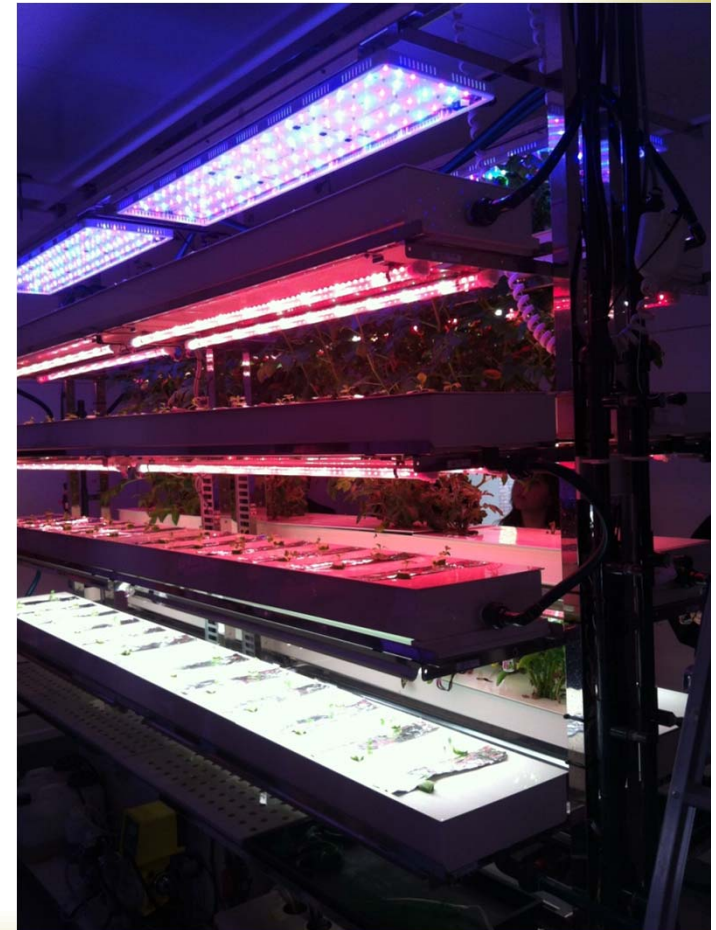
# Green Innovation Facility of Kyoto Prefectural University



# Dr. Takeba



- ∞ Different types of lighting
  - ∞ Red LED
  - ∞ Red/blue/green LED
  - ∞ Florescent
- ∞ Lighting Timing
  - ∞ Straight time vs 3 seconds on 2 off
- ∞ White vs Black polyurethane
  - ∞ Algae growth

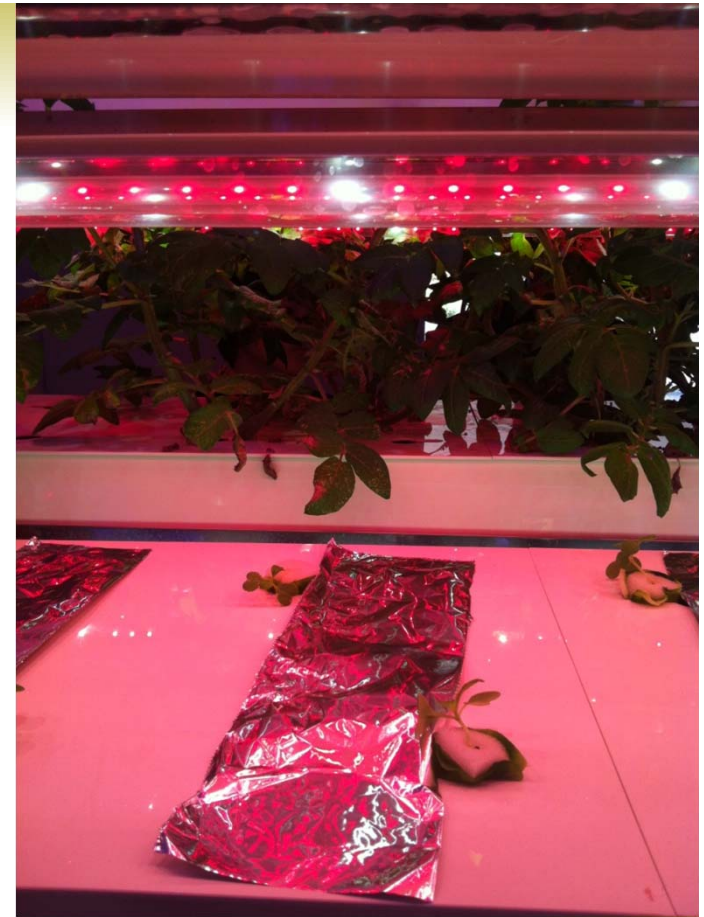


☞ Solar panels

☞ Air conditioner

☞ Hydroponic system

☞ Efficient nutrient manipulation



# Major Issue



Food Sustainability

vs

Food Security

# Animal Agriculture



# KU Livestock Farm



# 4 differences in beef production between Japan and Canada



- ∞ Size and structure of cattle
- ∞ Cow calf and feedlot integration
- ∞ Operations are covered and intensive
- ∞ Handling

# Size and structure of cattle



## ∞ Stature

∞ Shorter and thicker cattle typically

∞ Wider build

## ∞ Marbling

∞ Intense marbling not sought after in Canada





# Cow calf feedlot integration



- ❧ Cow calf feedlot operations in Japan are integrated together in one operation
- ❧ In Canada these operations are separated and many small cow calf operation feed into a single large feedlot operation
  - ❧ EX: 40,000 head of cattle

# Sheltered production

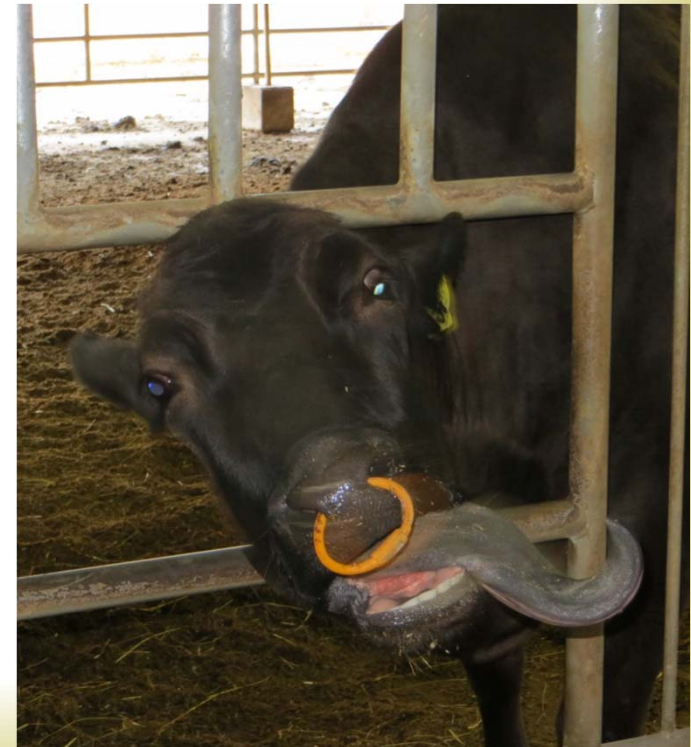


- ☞ Most production in Japan is intensive and is sheltered from the elements
  - ☞ Likely because of increased rain received here
- ☞ In Canada cow calf production are normally outdoors
  - ☞ Both feedlots and cow calf operations are outdoors

# Handling



- Because of smaller quarters on the farm, many cattle have nose rings for handling
- This is not the case in Canada (only in bulls and show animals) this is because of large areas that support different handling methods.



# Sustainability Pros



- ❧ Grazing unusable mountain range land
- ❧ Waste management
  - ❧ Covered pens prevent runoff
- ❧ Integration of processes
  - ❧ Increases space efficiency
- ❧ Future: using food processing by-products as feed (soybean curd residue, potato cake waste, noodle waste)

# Cons



- ⌘ Longer time to market
  - ⌘ Increased marbling leads to a slower growth rate
  - ⌘ More feed used and waste produced
  - ⌘ More maintenance energy used
- ⌘ Importing most of fed

# Questions??

