



New Markets for Alfalfa

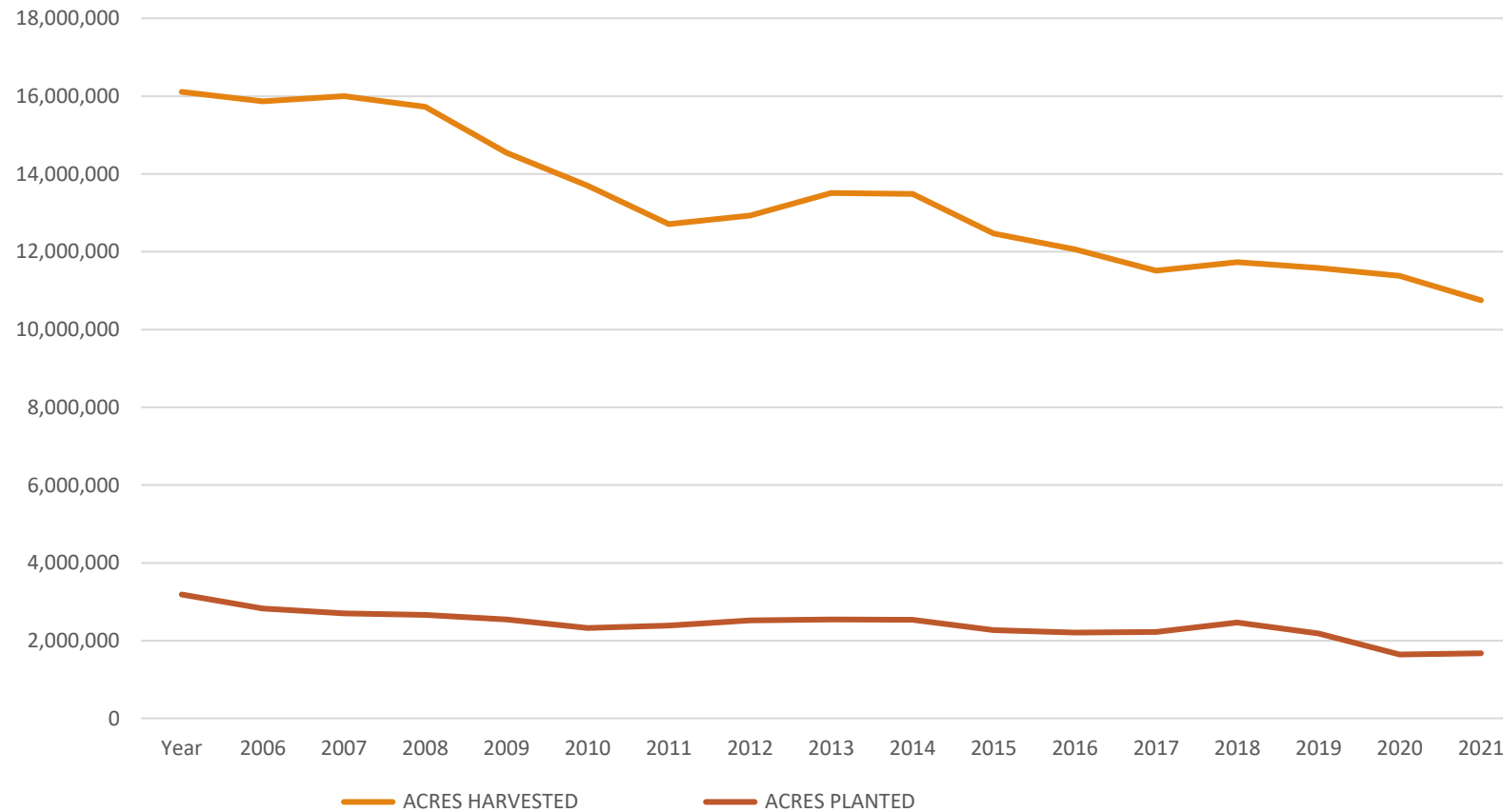
JO HEUSCHELE

USDA-ARS-PSRU

WESTERN ALFALFA AND FORAGE SYMPOSIUM

DECEMBER 13, 2023

US Alfalfa Acreage

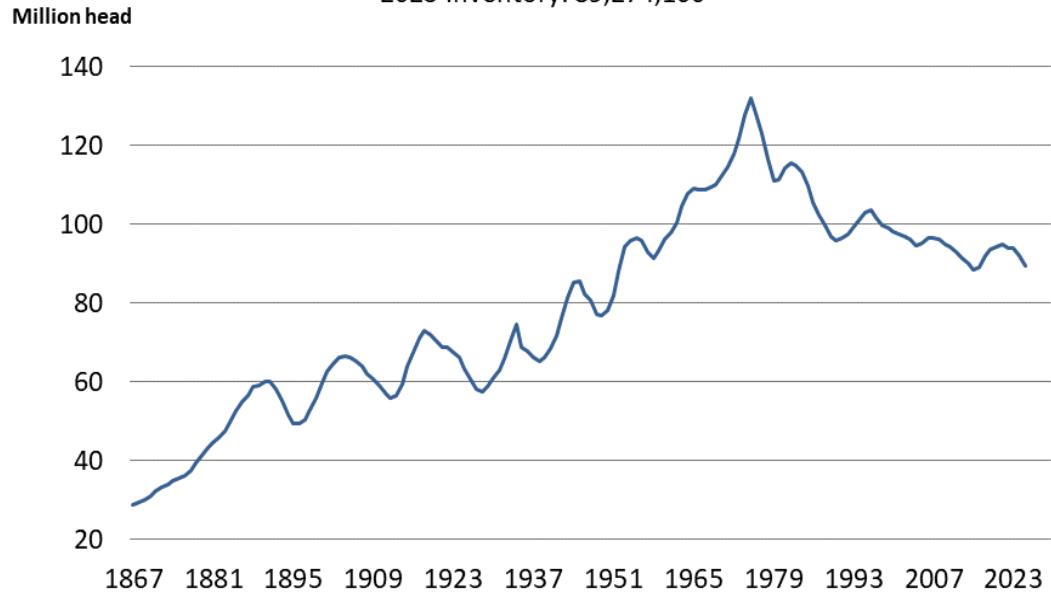


Consumers a



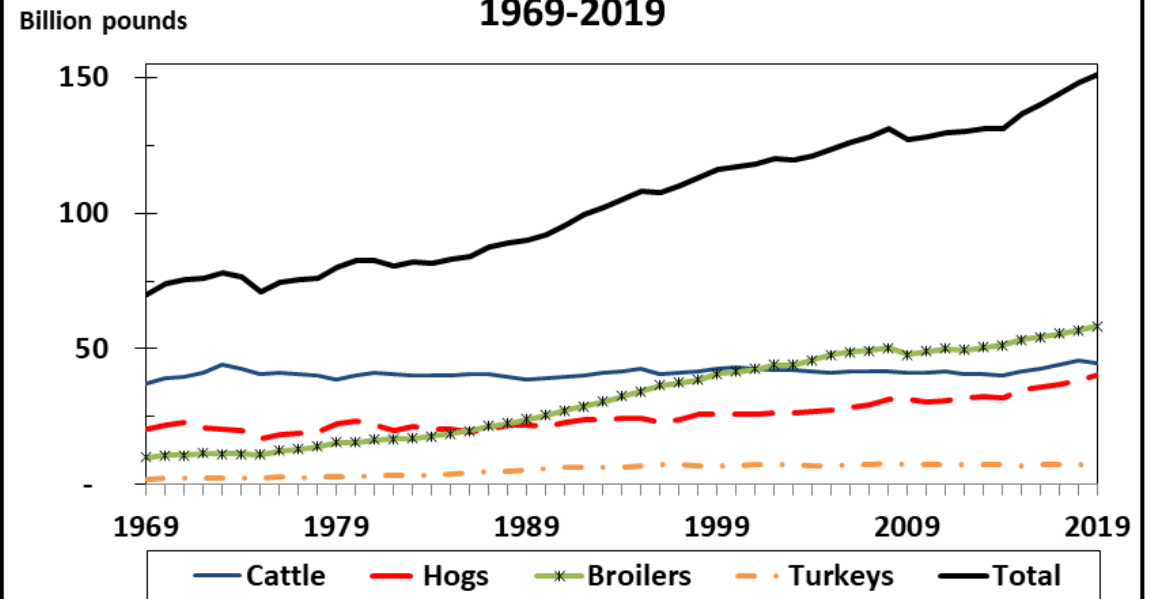
All Cattle and Calves Inventory – United States: January 1

2023 Inventory: 89,274,100



USDA-NASS
1-31-2023

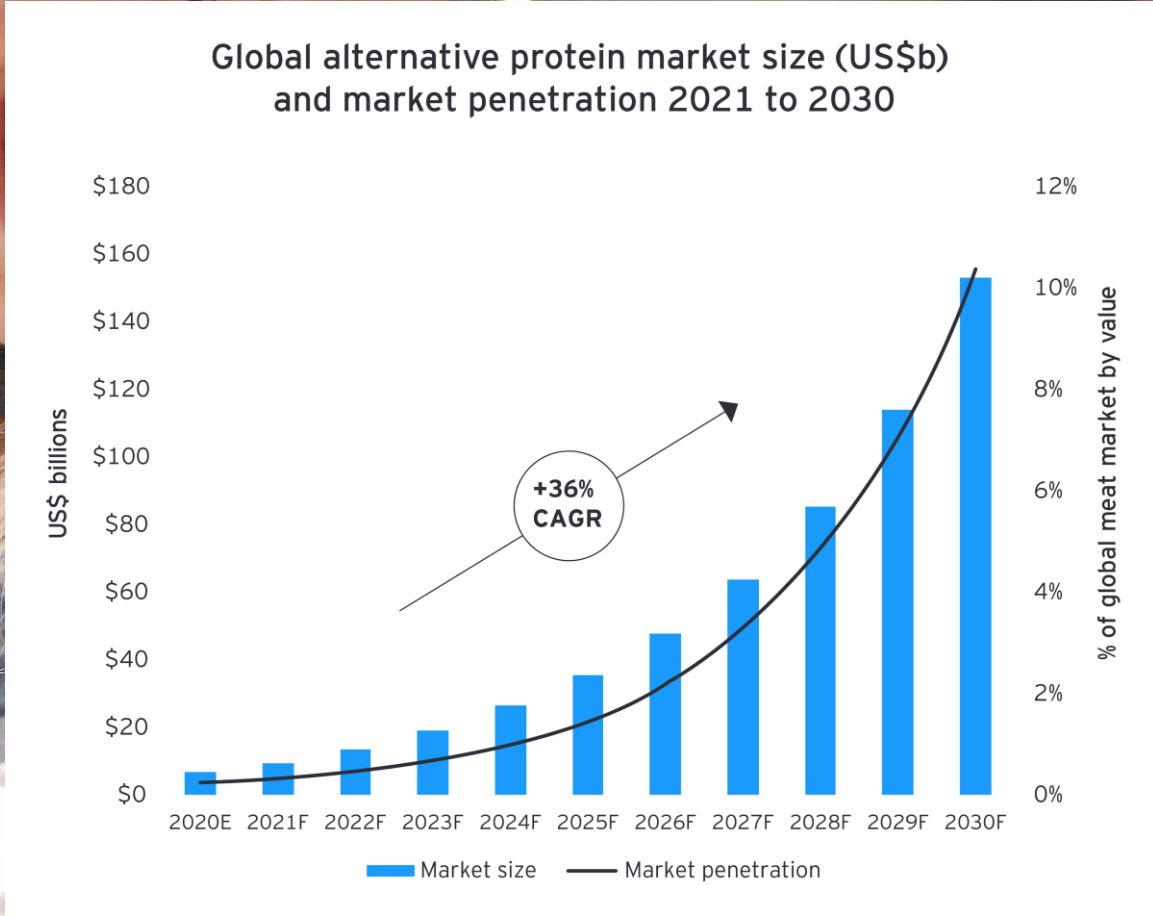
Meat Animals Pounds Produced 1969-2019



USDA-NASS
April 30, 2020



New Consumer

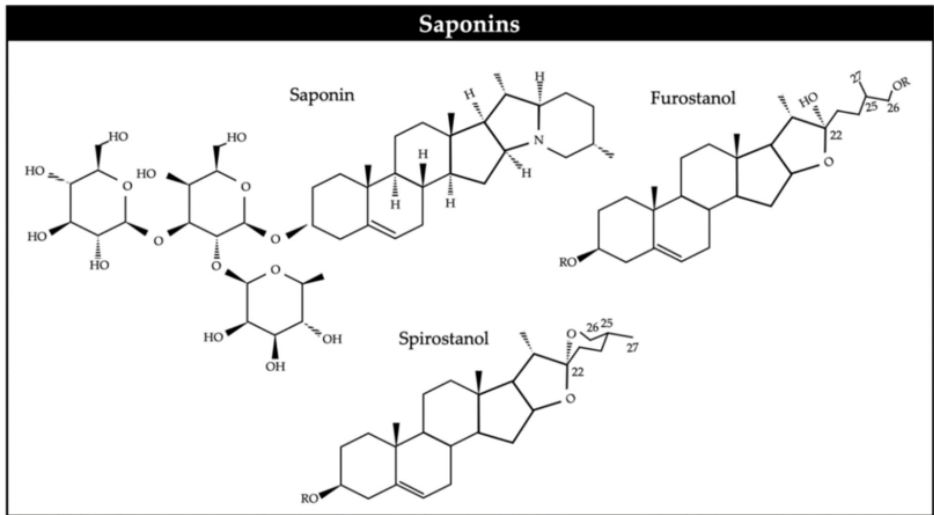


Why Alfalfa



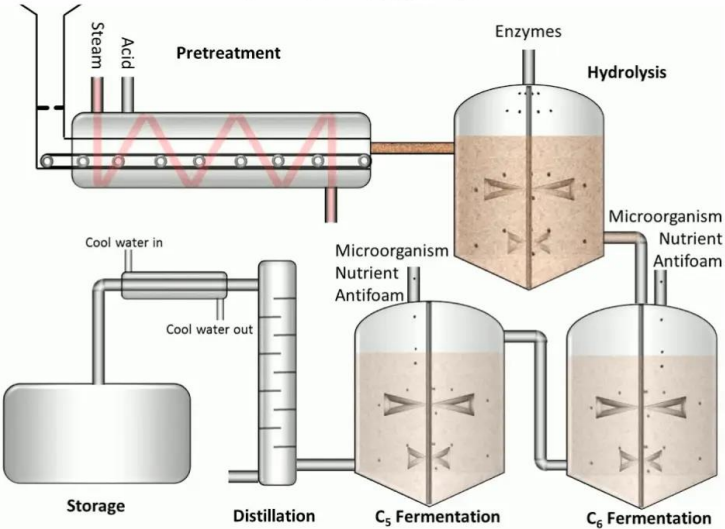
Compound	Alfalfa Type	Nutrient needs
Calcium	APC, Forage, Juice	✓
Copper	APC,	✓
Crude Fiber	APC, forage, juice	✓
Iron	APC, Juice	✓
Magnesium	APC, concentrate	✓
Manganese	APC, concentrate	✓
Potassium	APC, Concentrate	✓
Total essential Amino Acids	APC, Concentrate, Forage, Juice	✓
Vitamin K	APC	✓
Zinc	APC, Concentrate, Juice	✓
B-carotene	APC	✓

Opportunities



AN ILLINOIS ALUMNI COMPANY

Fermentation





GREEN BIOMASS



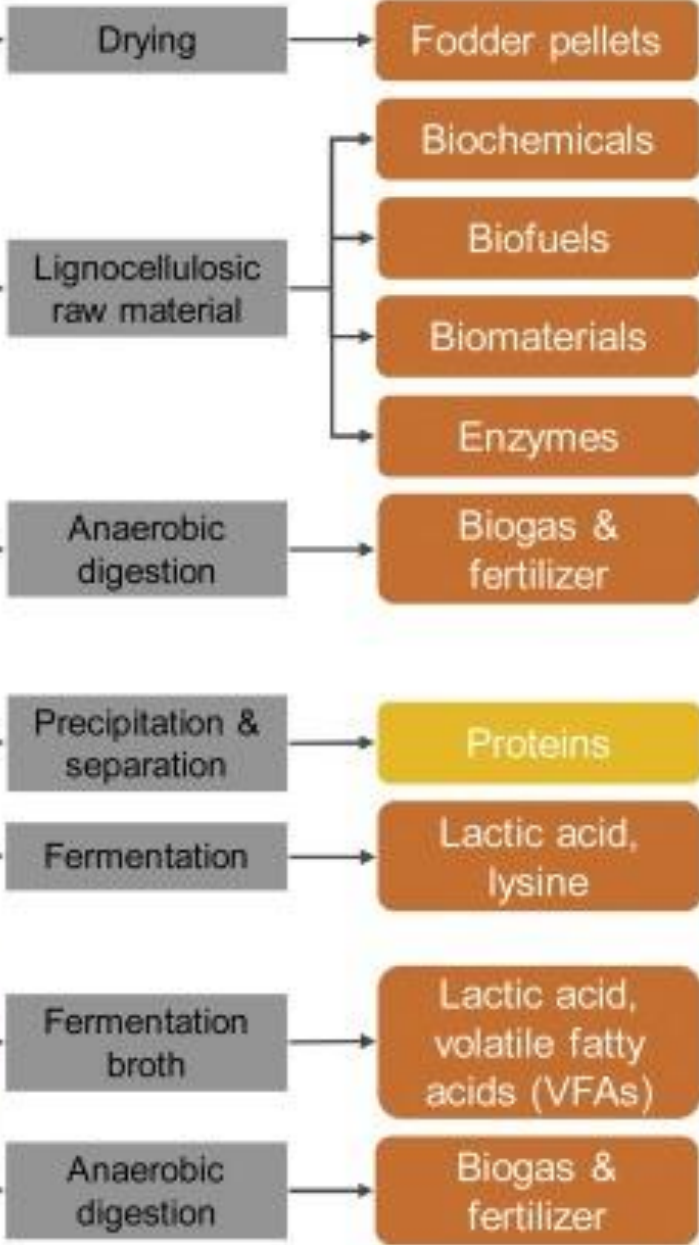
FIBER-RICH PRESS CAKE

Mechanical fractionation

NUTRIENT-RICH GREEN JUICE



BROWN JUICE

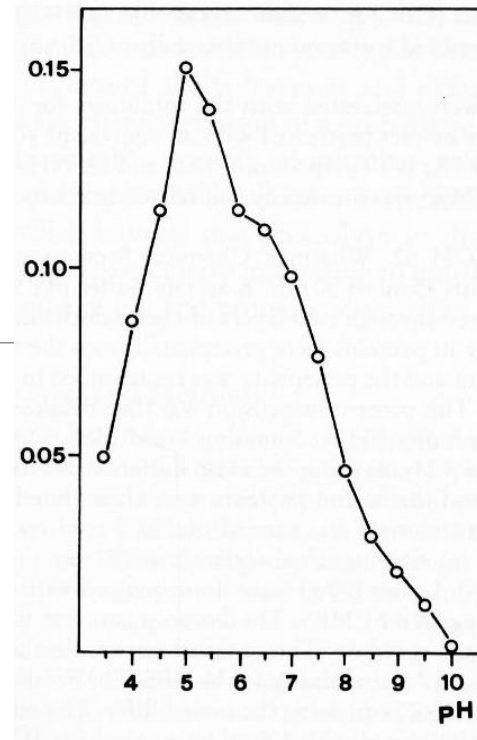


Challenges. . .

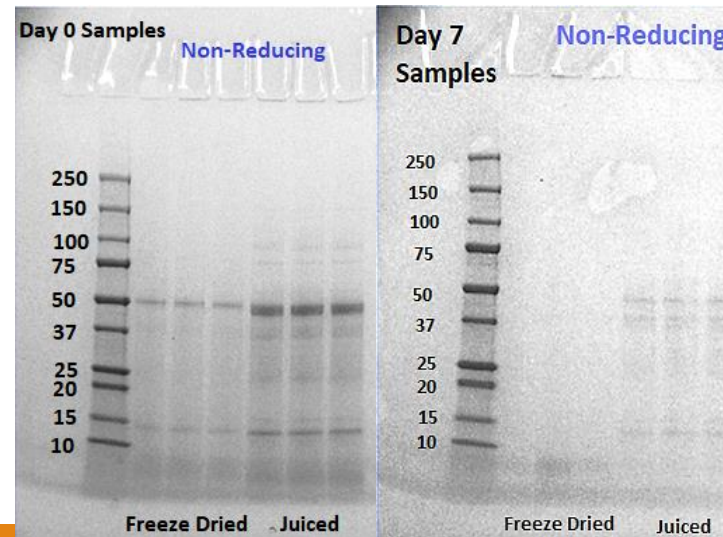
- Proteolysis of leaf proteins by endogenous leaf proteases between the time of harvest and the early stages of processing accounts for **substantial losses (up to 40%)** in recoverable protein from alfalfa leaves.

Finely et al. *J. Sci. Food Agric.* 1980, **31**, 156-161

- Hydrolysis – the addition of water reactivates proteases



Knuckles & Kholer. *Plant Biology* Vol. 116.p.p. 133—145(1984)



Smovzhenko et al., unpublished

Research

Industrial Scale

Small Scale

Technology

Adoption

To Market...to market... to buy alfalfa....





Questions