

4-H, FFA Projects and 50 Years of Progress

Paul VanRaden

2025

Goals

- Review **4-H** and **FFA** records kept while I was a grade school / high school student in the 1970s.
- Explain how record keeping makes students think more clearly.
- Show how traits, prices, and profits differed for individual animals, crops, or varieties within crops. (**\$1** in 1975 = **\$6** in 2025)
- Remember all the hard work we did as kids back then.
- Compare current yields to yields from 50 years ago.

4-H and FFA programs help teach agriculture

- **4-H** Pledge:

- I pledge my **h**ead to clearer thinking,
- my **h**ear to greater loyalty,
- my **h**ands to larger service, and
- my **h**ealth to better living,
- for my club, my community, my country, and my world.
- [4-H - Wikipedia](#)

- **FFA** Motto:

- Learning to Do,
- Doing to Learn,
- Earning to Live,
- Living to Serve.

- [National FFA Organization - Wikipedia](#)

4-H gardening - 1973



- Family garden of 2,352 square feet = 261 square meters
- Value of produce = **\$76**
- Cost of seeds + fertilizer = **\$7**
- 90 hours of my labor plus 50 hours of family labor @ **\$1 / hour** = **\$140 cost**
- Management loss = **\$ -71**
- Much smaller garden in 1974!

Crop	Yield	Value (\$)
Strawberries	103 quarts	51.50
Radishes	75	1.00
Green beans	50 pounds	12.50
Carrots	18	0.60
Peas	10 pounds	2.00
Lettuce	15 pounds	3.00
Potatoes	15 pounds	2.00
Green onions	5 bunches	0.75
Cabbage	12 pounds	1.20
Tomatoes	7 pounds	0.50
Squash	5 pounds	0.50

4-H dairy cows

- Each of the 6 VanRaden kids got a newborn calf as a 4-H project when about 9 years old.
- Those calves and their descendants were ours to raise and manage.
- **Photo:** Paul (center) and first calf Spotty with Renea (left), brother Dave (right), and sister Deb (on hayrack)



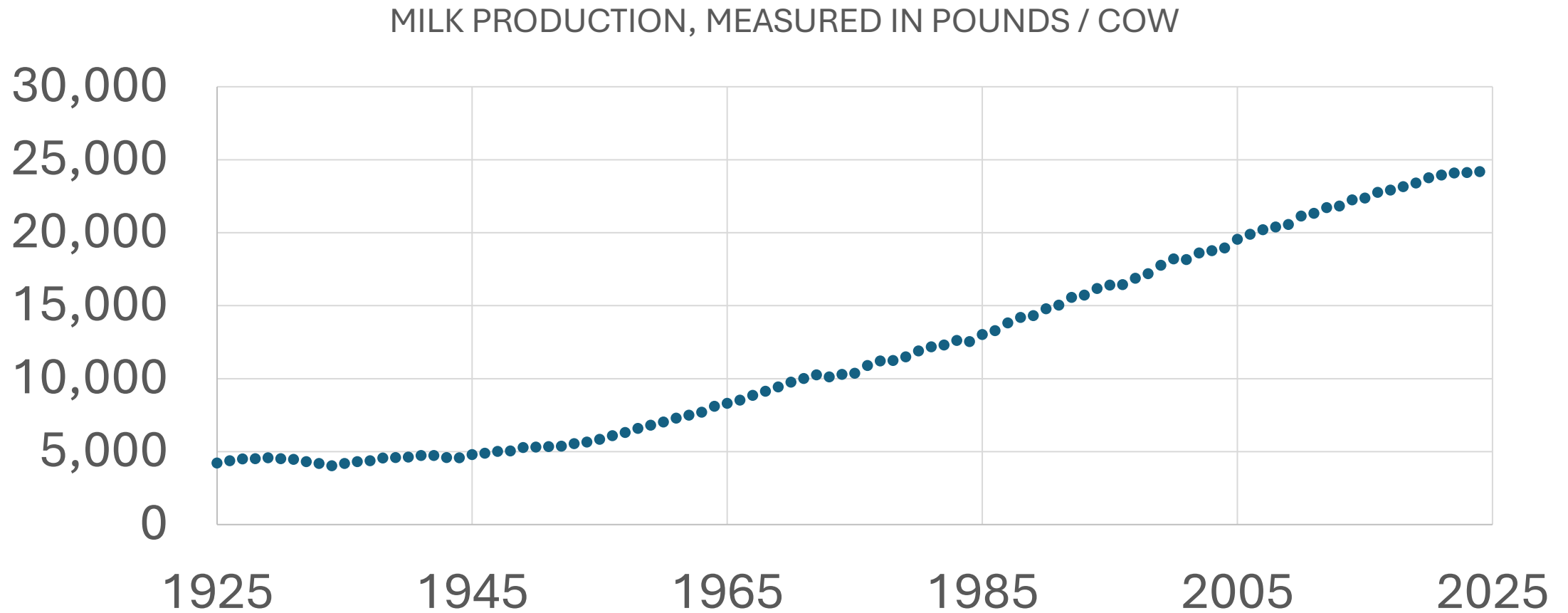
Compare tested dairy cows in 1972 to 2022

Herds averages from:	Cows	Milk pounds	Fat pounds	Year
<i>National DHIA</i>	2,000,000	28,416	1,162	2022
<i>National DHIA</i>	740,000	14,581	536	1972
<i>Walter VanRaden</i>	30	13,324	497	1972

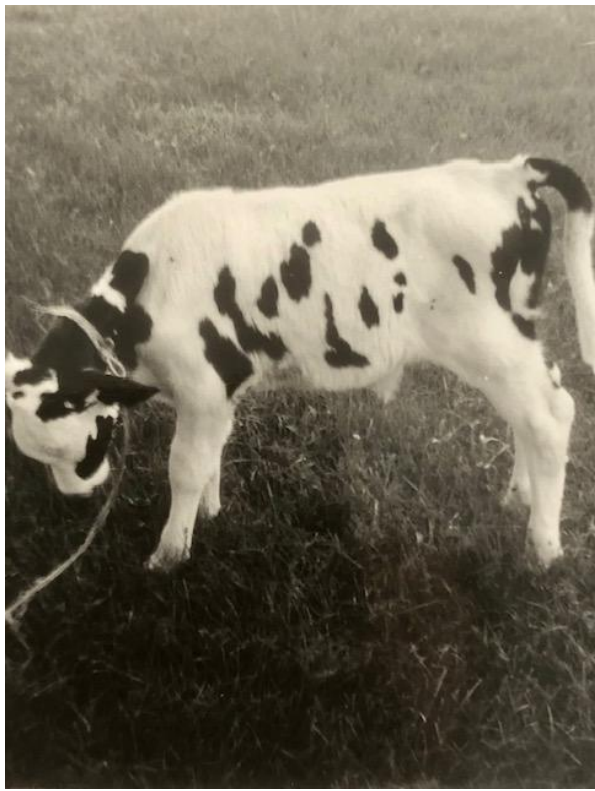
Milk and butterfat produced per cow per year averages about twice more now than 50 years ago. About 3 times more cows now in national data recording (Dairy Herd Improvement Associations). Walter VanRaden herd was slightly below the 1972 national average production. He sold his 30 cows in 1972 and started a business repairing farm machinery. Next slides show all US cows and actual DHIA records of each of his kid's 4-H project cows.

Milk production for all U.S. cows 1924-2024

Source: [USDA NASS](#)



Owner	Cows	Age (Yr-Mo)	Days in milk	Milk pounds	Fat pounds	Year
Mark	Abigail	2-1	305	11,841	398	1969
		3-1	305	12,377	420	1970
		4-7	239	10,931	354	1972
Miriam	Teena	3-1	276	9,182	308	1968
		4-2	252	8,307	300	1969
		5-2	305	8,800	325	1970
	Tana	2-3	294	9,324	321	1971
	Tina	2-7	305	13,019	438	1972
		3-10	305	16,030	546	1973
Deb	Wonder	2-3	271	10,839	402	1969
		3-1	305	13,073	515	1970
		4-2	286	15,204	611	1971
		5-2	251	13,572	489	1972
	Wander	2-4	2	N/A	N/A	(inc)1972
Judy	Judy	2-2	305	9,812	355	1971
		3-5	280	10,408	404	1972
Paul	Spotty	2-4	29	1,131	52	(inc)1972

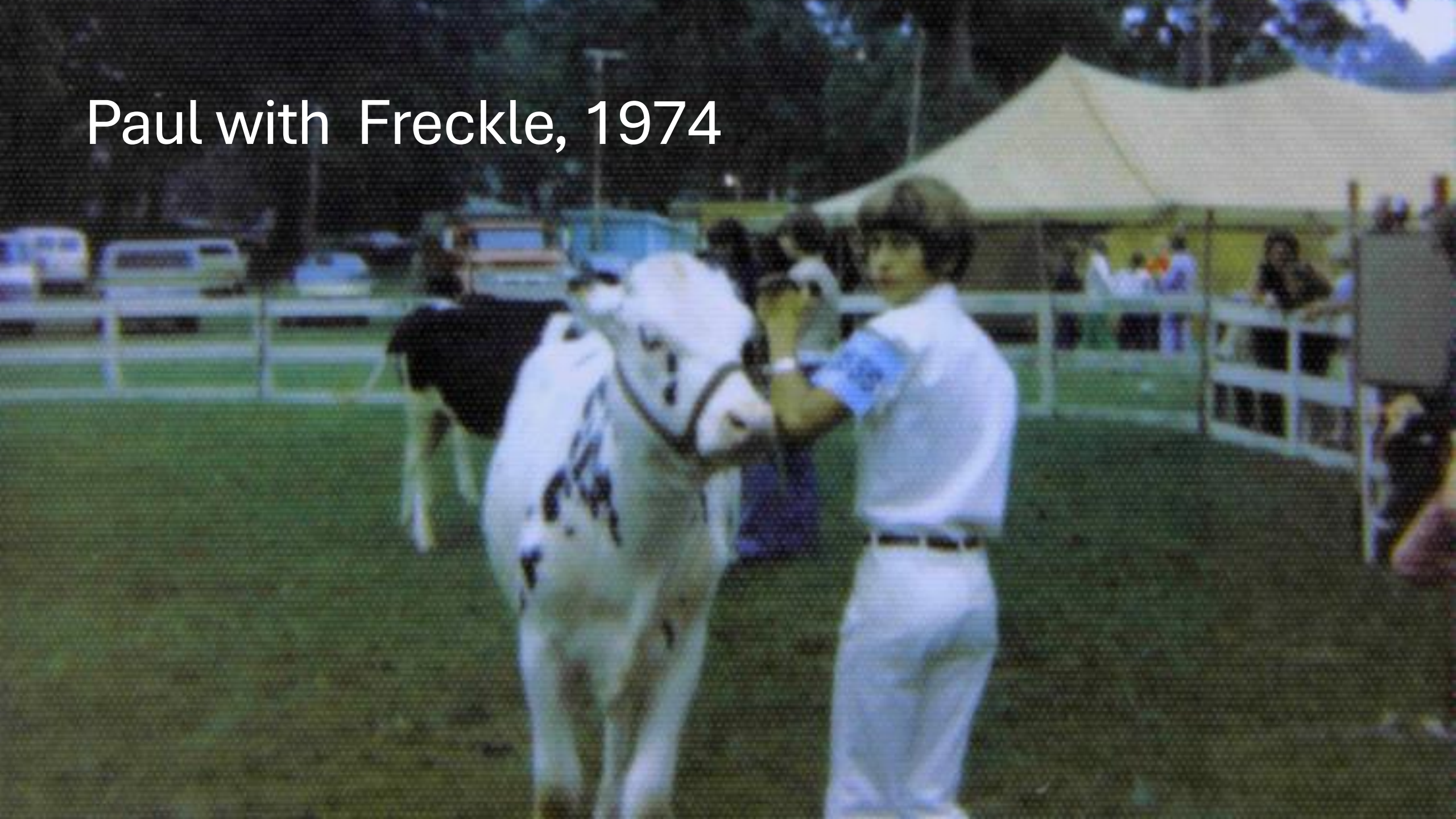


Spotty's 1st bull calf: Spot, 1972

Spotty's
1st heifer
calf:
Freckle,
1973

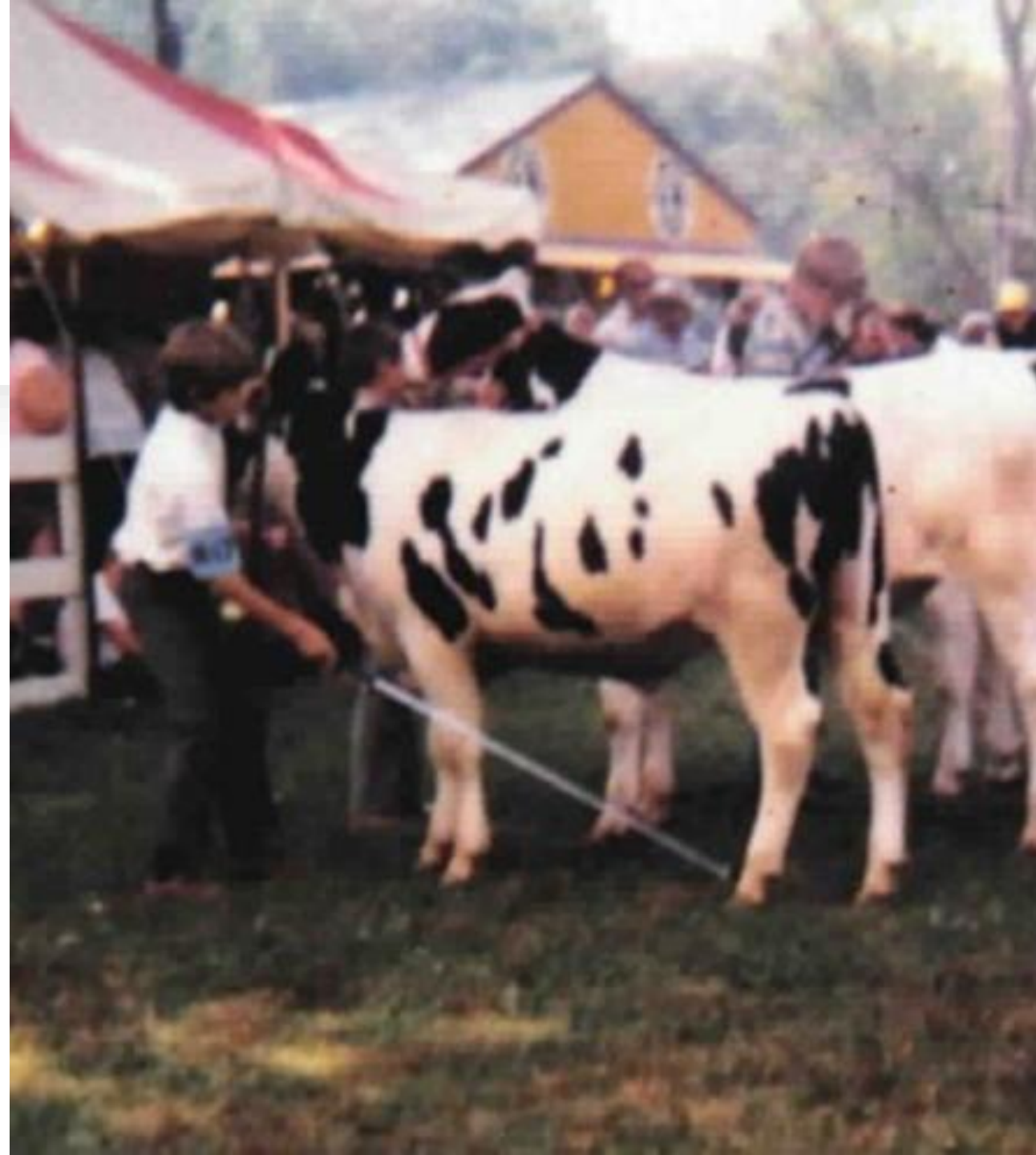


Paul with Freckle, 1974



FFA beef steers – 1973, 1976

- **Photo:** Paul in 1973 with his first steer Spot
- 4 steers in 1976 gained 2765 pounds and 1.9 pounds/day compared to state average of 2.0. Sold for **\$0.315/pound**.
- Income was **\$872**.
- Expenses were **\$1228** = \$794 grain + \$270 hay + \$32 other costs + 66 hours of labor @ \$2 / hour.
- Management loss was **\$ -356**.



My 4 Holstein steer records - 1976

Steers	Begin Weight pounds	End Weight pounds	Days	Gain pounds / day	Price \$ / pound
Erny	650	1245	290	2.05	0.31
Bert	425	1050	365	1.71	0.30
Ben	375	1000	365	1.71	0.32
Span	350	1020	365	1.84	0.33

DHIA cow testing project – 1976-78

- Required training at U of Illinois
- Recorded data and collected milk samples from 5 local herds
- Worked 33 hours per month and earned \$73 / month
- Pay averaged \$2.20 / hour billed to each farmer as part of monthly testing fee
- Star State Agribusiness Award from **FFA**



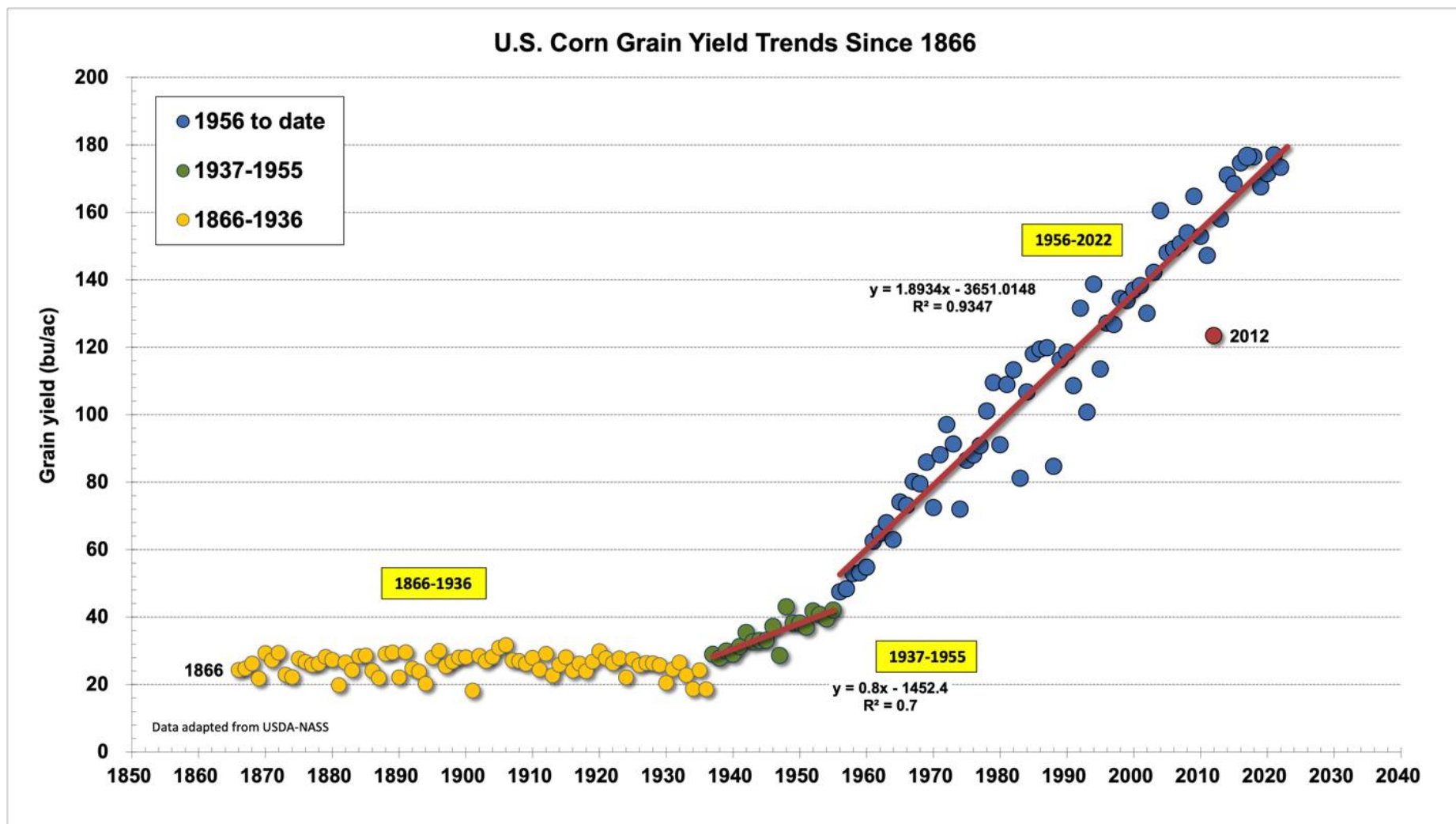
FFA corn project - 1976

- Yield 99 bushels per acre vs. 105 Illinois state average.
- Price \$2.30 / bushel.
- Income **\$1587** from 7 acres.
- Cost **\$807** plus \$58 labor = 29 hours @ \$2/hour.
- Management earnings **\$742** = \$106 / acre.
- US corn yields averaged about 80 bushels / acre in 1972 and 178 in 2022.
- Corn yields now 2.2 times those 50 years ago.

My corn variety trial	Acres	Yield/acre
Funks G4252	3.5	98
Northrup King 606	1.5	110
Northrup King 65	1.0	93
Northrup King 614	1.0	100
Average or total	7.0	99

Corn yields 2.2 times higher than 1975

Source: [Historical Corn Grain Yields in the U.S. \(Purdue University\)](#)



Paul measuring
corn, July 4,
1976 and 1977



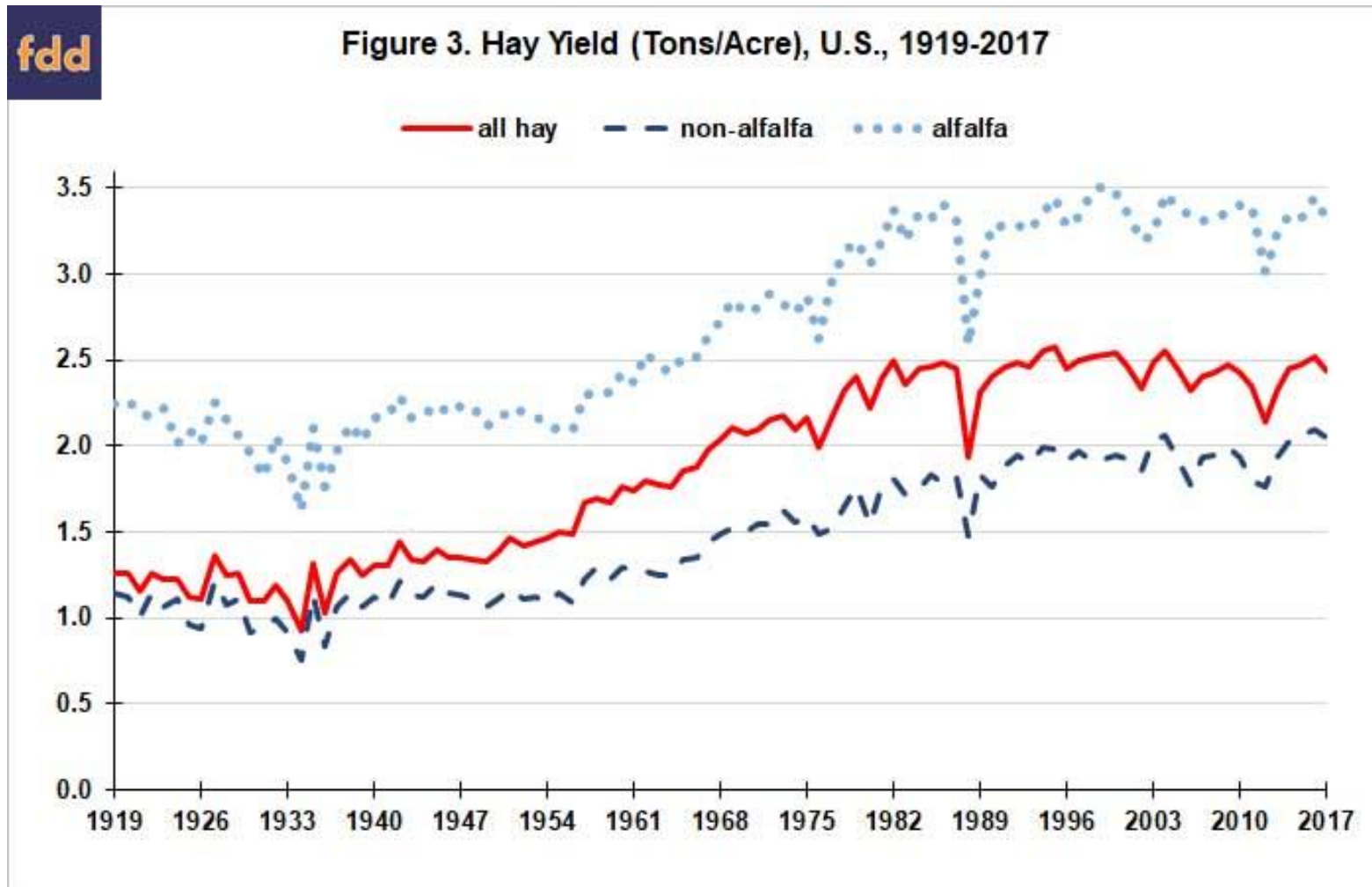
FFA alfalfa project - 1976

- Yield 3.8 tons / acre
 - Price \$47 / ton or \$1.18 / bale
 - Income **\$1575** from 9 acres and 1370 bales
 - Expenses **\$808** plus **\$76** of labor = 38 hours @ \$2 / hour
 - Management earning of **\$773** or \$86 / acre
-
- U.S. alfalfa yields averaged 2.7 tons in 1974 and 3.4 tons in 2024
 - Alfalfa yields only 1.26 times the yields of 50 years ago.
 - Cows now eat much more corn silage, much less alfalfa



Alfalfa yields increased little since 1975

Source: [U.S. Hay Market over the Last 100 Years - farmdoc daily](#)



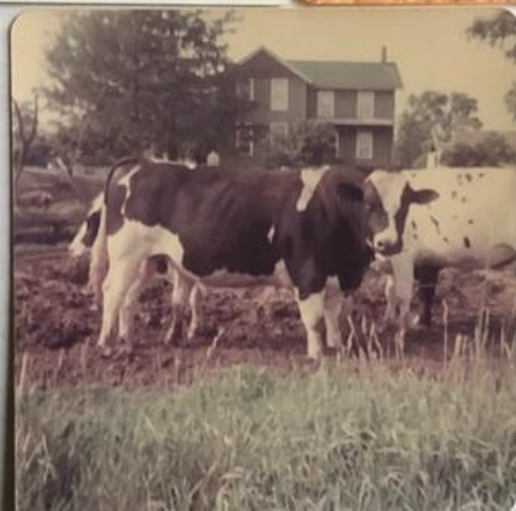
Compete on record keeping, not yields

- FFA awards were given for ability to manage and profit.
 - Total earnings **\$5,665** during high school years.
- I kept records for 16 acres, but my brother and I managed and supplied most labor for 240 acres while our father worked in town.
- Then my brother managed the whole farm after I left for college.
 - He won the Illinois state FFA award for Crop Production, 1980.
 - I won the Crop Production award for northwest section of IL.
- Accounting and reporting forms were separate for each enterprise and very helpful.



4-H photography by sister Miriam – 1967

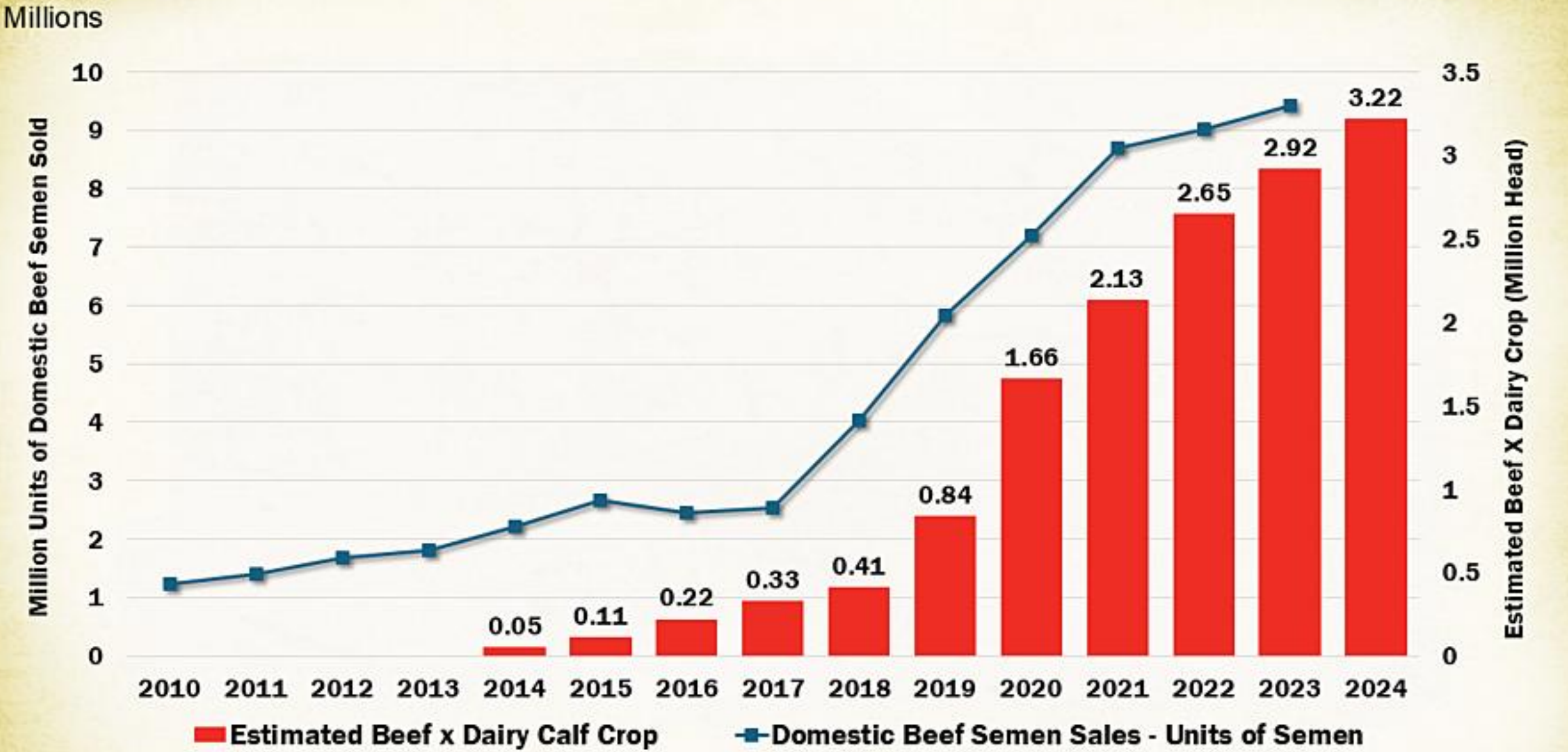
Bull wins, Paul loses.



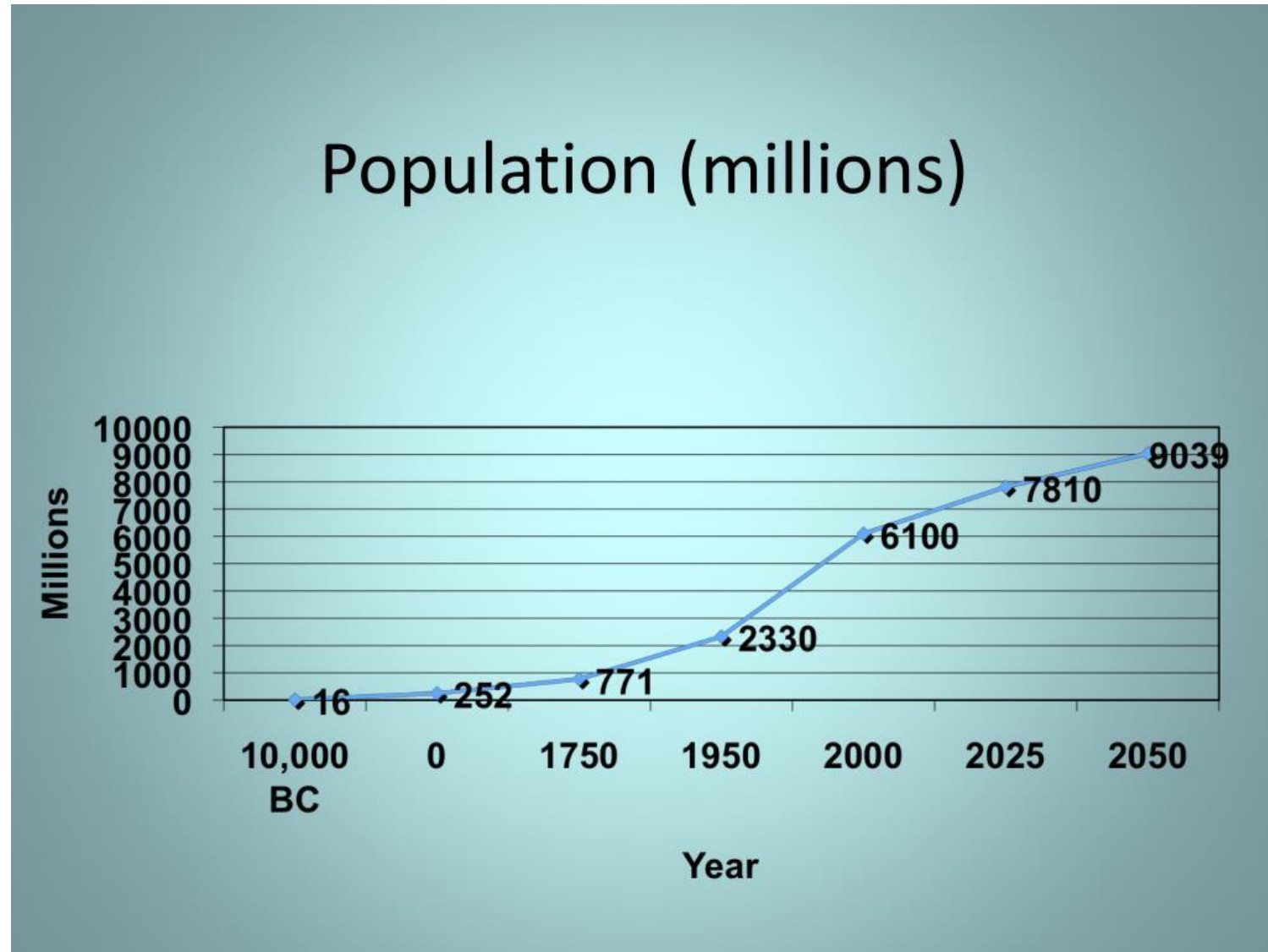
Use of Artificial Insemination has doubled

- In 1938, Artificial Insemination (AI) began in USA.
- In 1970, [46% of dairy cows](#) were bred by AI.
- In 2025, over 80% of dairy cows are bred by AI.
- AI and frozen semen made rapid genetic progress for milk yield possible across the world.
- Sources: [100 Years of Cooperative Extension: Rutgers Dairy Specialist Enos J. Perry Made Agricultural History : Newsroom](#)
- [Beefing Up Dairy: The Rise of Crossbreeding | Market Intel | American Farm Bureau Federation](#)

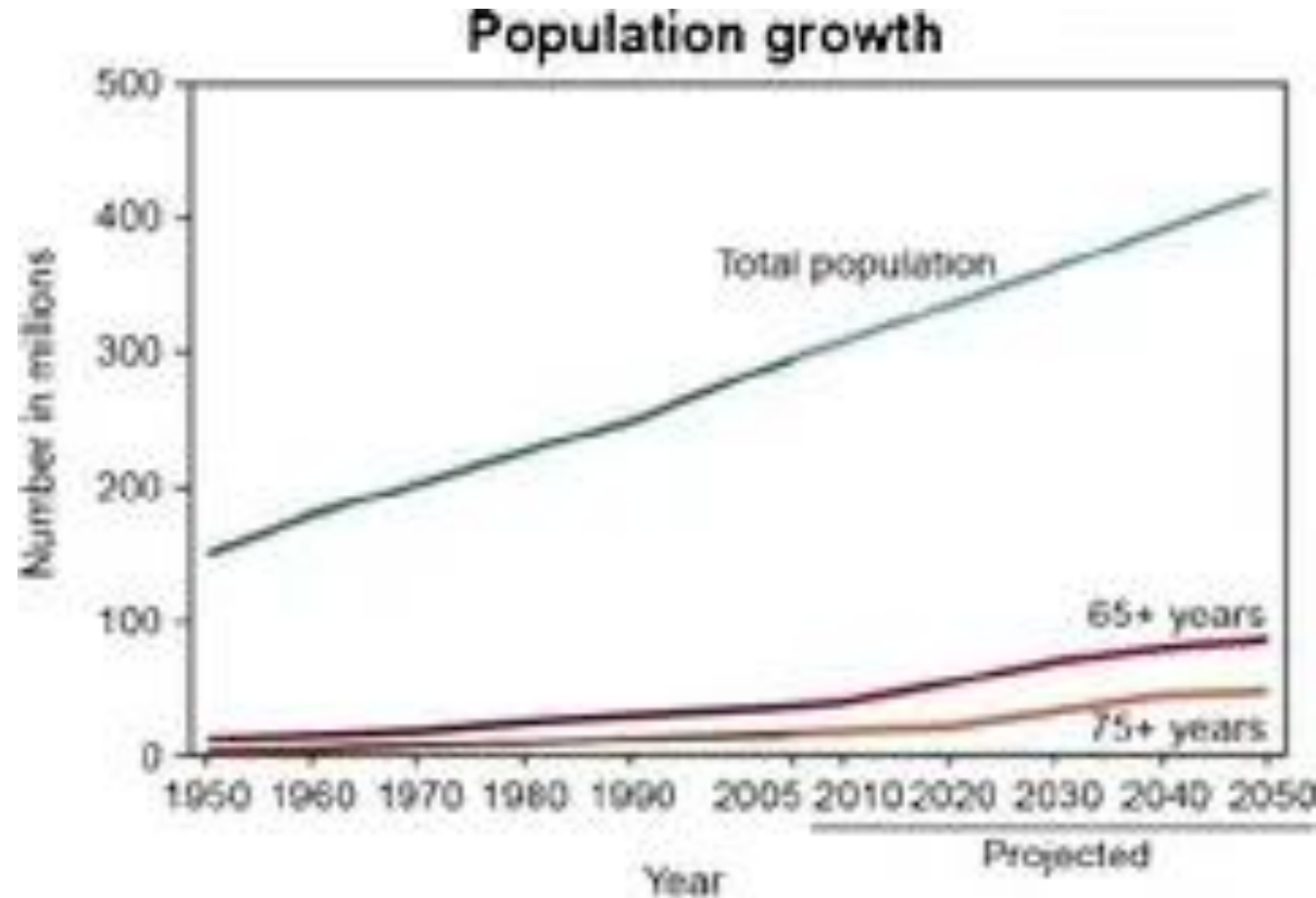
FIGURE 1: DOMESTIC BEEF SEMEN SALES & ESTIMATED BEEF X DAIRY CALF CROP



World population 2.03 times higher than in 1975
(8.26 vs. 4.07 billion)



USA population 1.63 times higher than in 1975
(348 vs. 214 million)



FFA jacket still fits 50 years later



Conclusions

- **4-H** and **FFA** projects help students learn how to earn a living.
- Recording prices and data makes us understand business better.
- Agriculture has provided the food everyone needs:
 - Corn fields yield 2.2 times as much corn, wheat fields 2.2 times the wheat, and rice fields yield twice the rice of 50 years ago.
 - Cows today give 2.3 times the milk of cows from 1972. Beef calves have 40% higher weaning weight and 65% faster daily gain. Chickens bred for egg production lay 79% more eggs by 60 weeks of age. Chickens bred for meat production grow 4 times faster and have >50% better feed efficiency.
- Many more people to feed than 50 years ago.
 - World has 2.03 times the population, US 1.63 times. We're not keeping up.

References on progress in other species

Milk cows: [Dairy cattle genetic trends](#)

Beef cattle: [Weaning Weight - Market Advisor](#), [PSXI-6 The Effects Cattle Breed \(Holstein Vs Angus × Holstein\) on Growth Performance, Energetic Efficiency, and Carcass Characteristics of Calf-Fed Steers - PMC](#)

Chickens: [Genomic selection in layer and broiler breeding - Lohmann Breeders](#)

Chickens: [Impact of genetics and breeding on broiler production performance: a look into the past, present, and future of the industry | Animal Frontiers | Oxford Academic](#)

Rice: [Rice yields, 2023](#)