



Cow-Calf Herd Size:

How Has the Industry Responded to Elevated Uncertainty?

Amber Oerly, Risk & Profit 2022

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Overview



- U.S. beef cow herd declining since 2020
- Cow-calf producers' herd decisions impact total beef supplies
- Costs, structure, technology, demographics, climate, and barriers to entry/asset fixity impact herd expansion/contraction decisions
- Unexpected events disrupted supply chains and created economic, environmental, and social uncertainty in beef industry
- Future cattle inventory is dependent on drought conditions

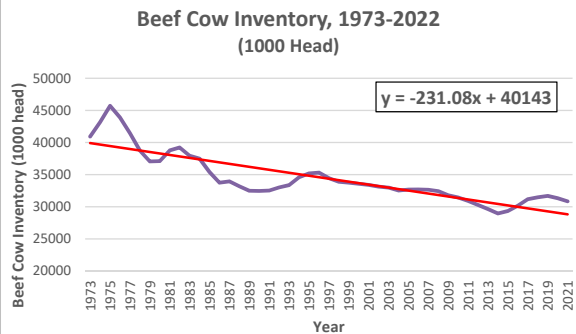
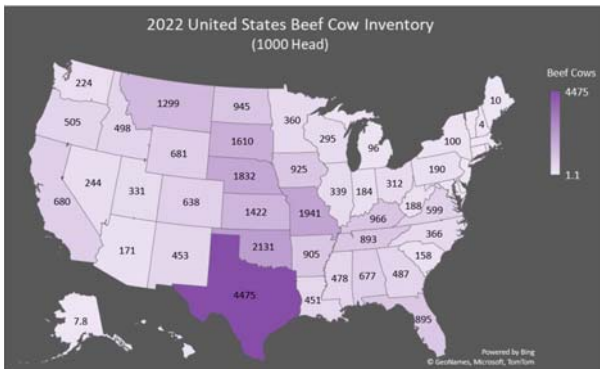


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Expansion/Contraction Factors

Expansion	Contraction
<ul style="list-style-type: none"> • High cow-calf returns • Global beef demand growth • Timing in current cattle cycle 	<ul style="list-style-type: none"> • Land availability and drought conditions • Increasing production efficiency • Producer demographics • Capital requirements • Commodity price volatility

U.S. Beef Cow Herd



Questions

- Has the relationship between feeder cattle price and cow-calf herd size changed over time?
 - Has increased uncertainty in the beef industry impacted how cow-calf producers respond to price changes when making herd expansion/contraction decisions?
- **Hypothesis:** Cow-calf producer sensitivity to changes in feeder cattle price has decreased overtime
 - Reducing the impact of a given % feeder cattle price change has on decisions to expand/contract herd



Objective

- Estimate the current relationship between feeder cattle prices and cow-calf herd size
 - Quantify the effect of changes in feeder cattle price has on herd size
- **GOAL:** Provide a better understanding of future cow herd expansion/contraction and update knowledge on cow-calf herd price sensitivity

Data

Variable	Description
Q_{BC}	Beef Cows (1000 Head)
P_{FS}	Feeder Steer Price (\$/cwt)
Drought	PDSI Drought Index (-4.0 = extreme drought, +4.0 = extreme moisture)
P_H	Hay Price (\$/ton)
P_{PR}	Pasture Rental Rate (\$/acre)
Slt	Steer Slaughter Weight (Pounds)

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+

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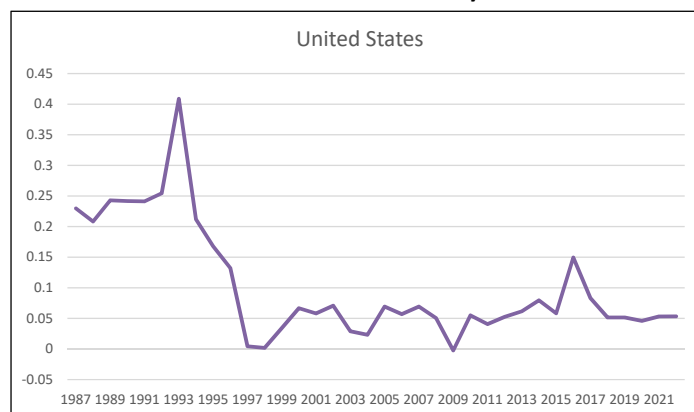
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+ / - = Expected effect on inventory

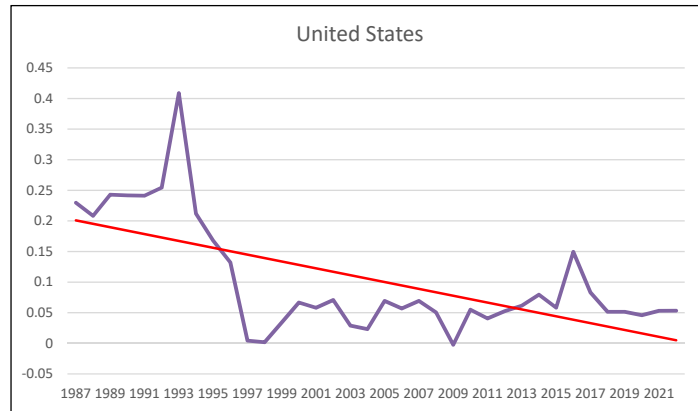
National Results

Cow-Calf Price Sensitivity Overtime



National Results

Cow-Calf Price Sensitivity Overtime



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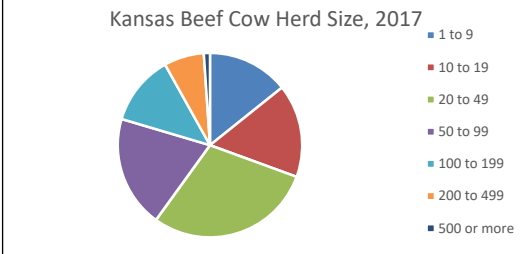
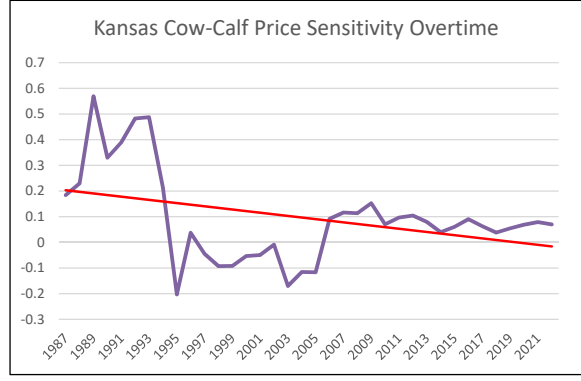
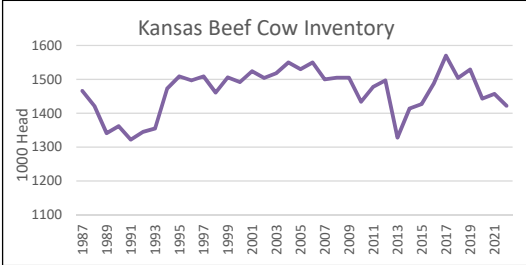
Regional Results

NOAA Climate Regions
– PDSI Drought Index

U.S. Climate Regions

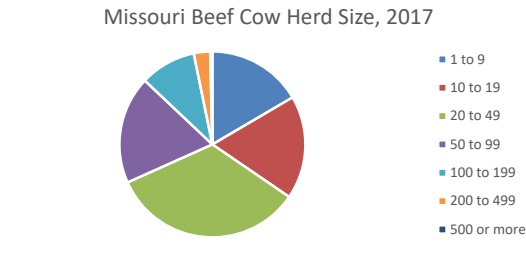
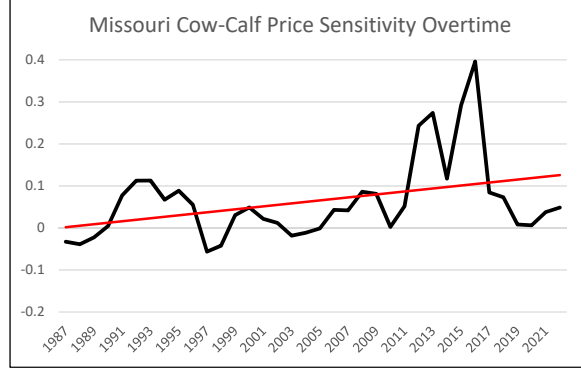
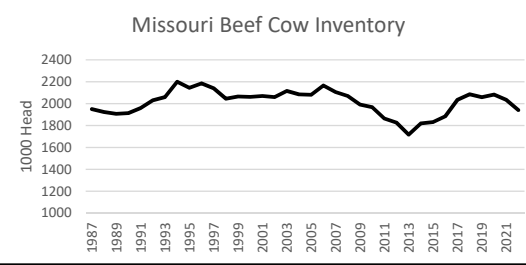


Kansas



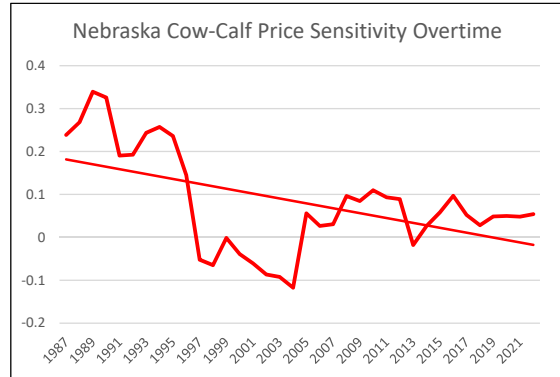
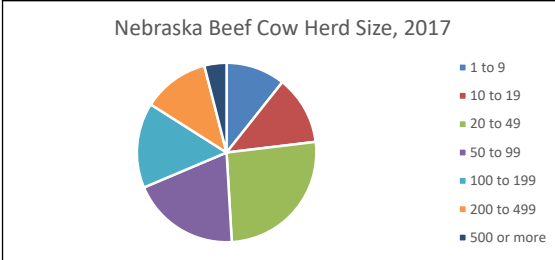
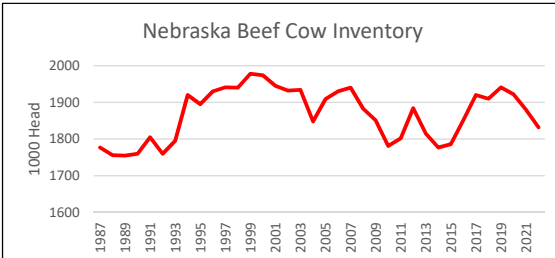
- Ranks 6th in Beef Cow Inventory
- Ranks 3rd in All Cattle and Calves

Missouri



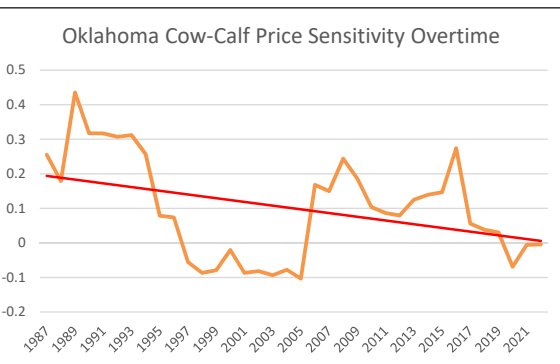
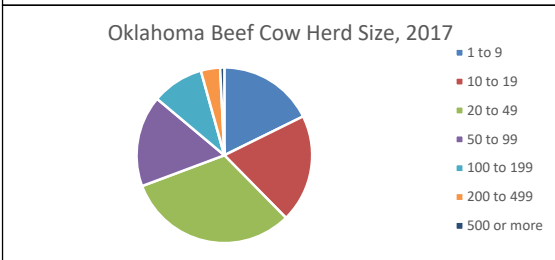
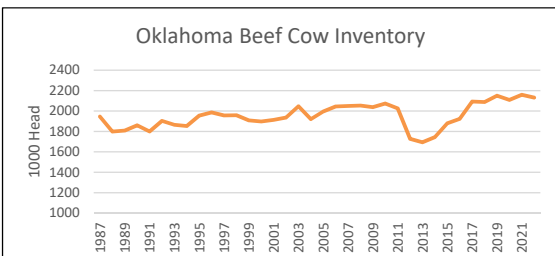
- Ranks 3rd in Beef Cow Inventory
- Ranks 6th in All Cattle and Calves

Nebraska



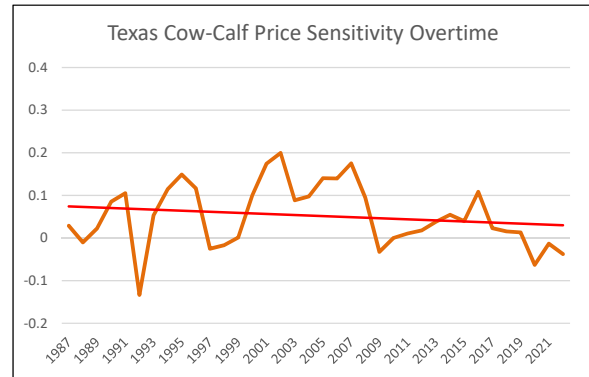
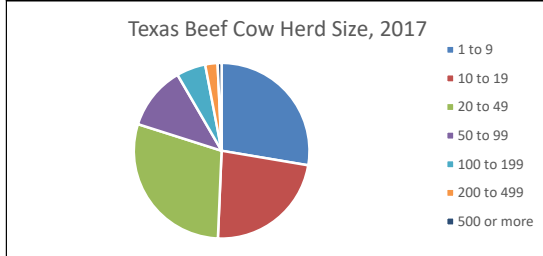
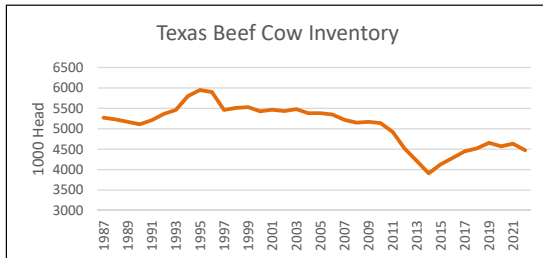
- Ranks 4th in Beef Cow Inventory
- Ranks 2nd in All Cattle and Calves

Oklahoma



- Ranks 2nd in Beef Cow Inventory
- Ranks 5th in All Cattle and Calves

Texas

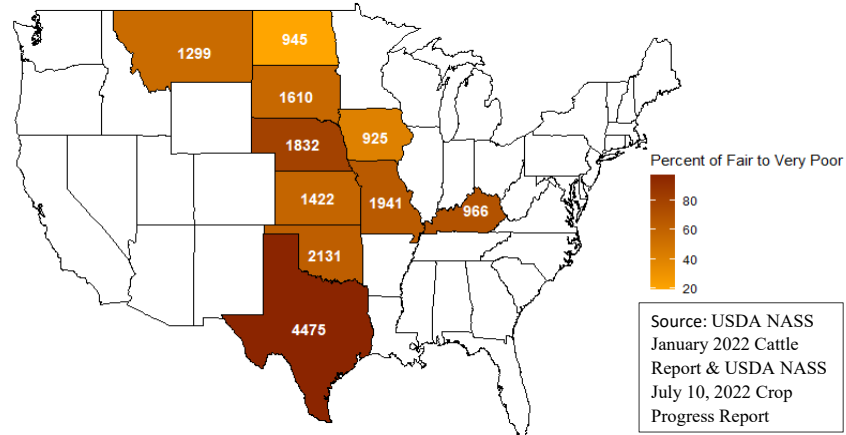


- Ranks 1st in Beef Cow Inventory
- Ranks 1st in All Cattle and Calves



Drought Conditions

Beef Cow Inventory compared to Pasture and Range Conditions



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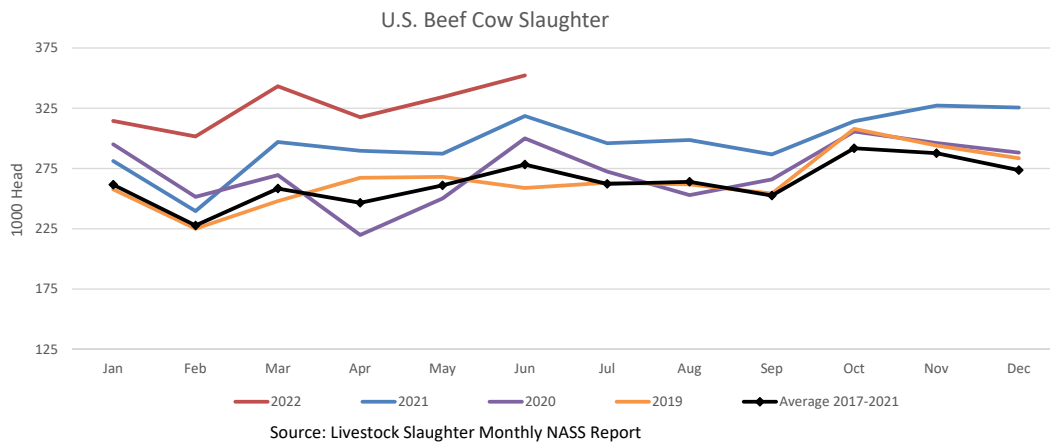
Drought Conditions

- Drought can decrease pasture availability
- Drought can increase corn and hay prices
- Leads to herd liquidation in key cow-calf regions



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U.S. Beef Cow Slaughter



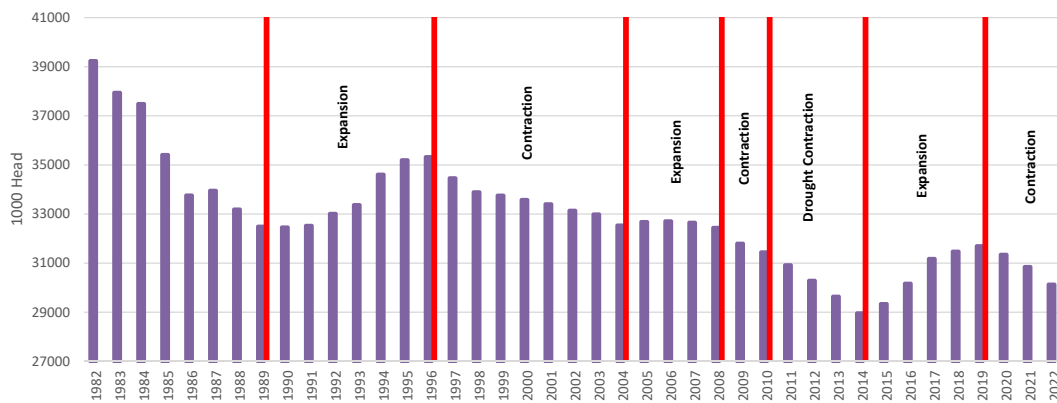
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U.S. Beef Cow Slaughter

- Drought increases cow slaughter
 - Increases beef production in short-run
- Heifer slaughter has also increased in 2022
 - Producers are selling heifer they intended to retain
- Impacts calf numbers in future seasons

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U.S. Beef Cow Inventory



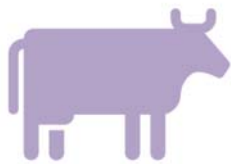
Source: USDA NASS Cattle Report

U.S. Beef Cow Inventory

- Drought is not sole reason for contraction
 - Position in cattle cycle
 - Elevated costs
- Cattle cycles are the expansion/contraction of the cow herd overtime
 - Market signals and biological nature

Conclusions

- Cow-calf producer sensitivity to changes in feeder cattle price has decreased overtime
 - Potentially due production efficiency, changes in costs, structure, technology, demographics, climate, and barriers to entry/asset fixity impact, and uncertainty
- Regionally differences impact price sensitivity and cattle inventories
- Drought conditions make future inventories uncertain



Questions?

Thank You!

References

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Preliminary Regional Results

Beef Cow Herd Own-Price Elasticities Overtime

KS, MO, NE, OK, TX, USA

