# FEASIBILITY OF AUTOMATIC MILKING SYSTEMS IN THE MIDWEST

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# Background

- Wisconsin is characterized by mostly small to medium-sized family farms, unlike other major dairy states like California and New York.
- In 2021, Wisconsin annual production reached 31.7 billion pounds of fluid milk, equivalent to 14% of the U.S. milk output.
- A tightening market for agricultural workers, supply chain bottlenecks, and price volatility have increased farm financial stress and expedited the exit of many small farms from the industry.
- Automatic milking systems (AMS) are seen as an alternative to hired labor.

# Acknowledgment


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# What is AMS?

- Automatic Milking Systems (AMS, or robotic milkers) use robotic arms to attach teat cups with the help of sensors for a "hands-free" milking operation.
- Depending on type, the AMS may use a sorting gate to control flow of cow traffic into the system.
- Cows are identified using ID tags and the AMS generates a wealth of data on milking frequency, quantity per teat, milk temperature, etc.

# The Dairy AMS Survey - 2023

- Conducted in January 2023 by the UW-Survey Research Center
- Distributed to random sample of 2,000 dairy farmers in Wisconsin & Minnesota
- Number of response: 665
- Response rate: 33%
- Farmers with AMS: 39

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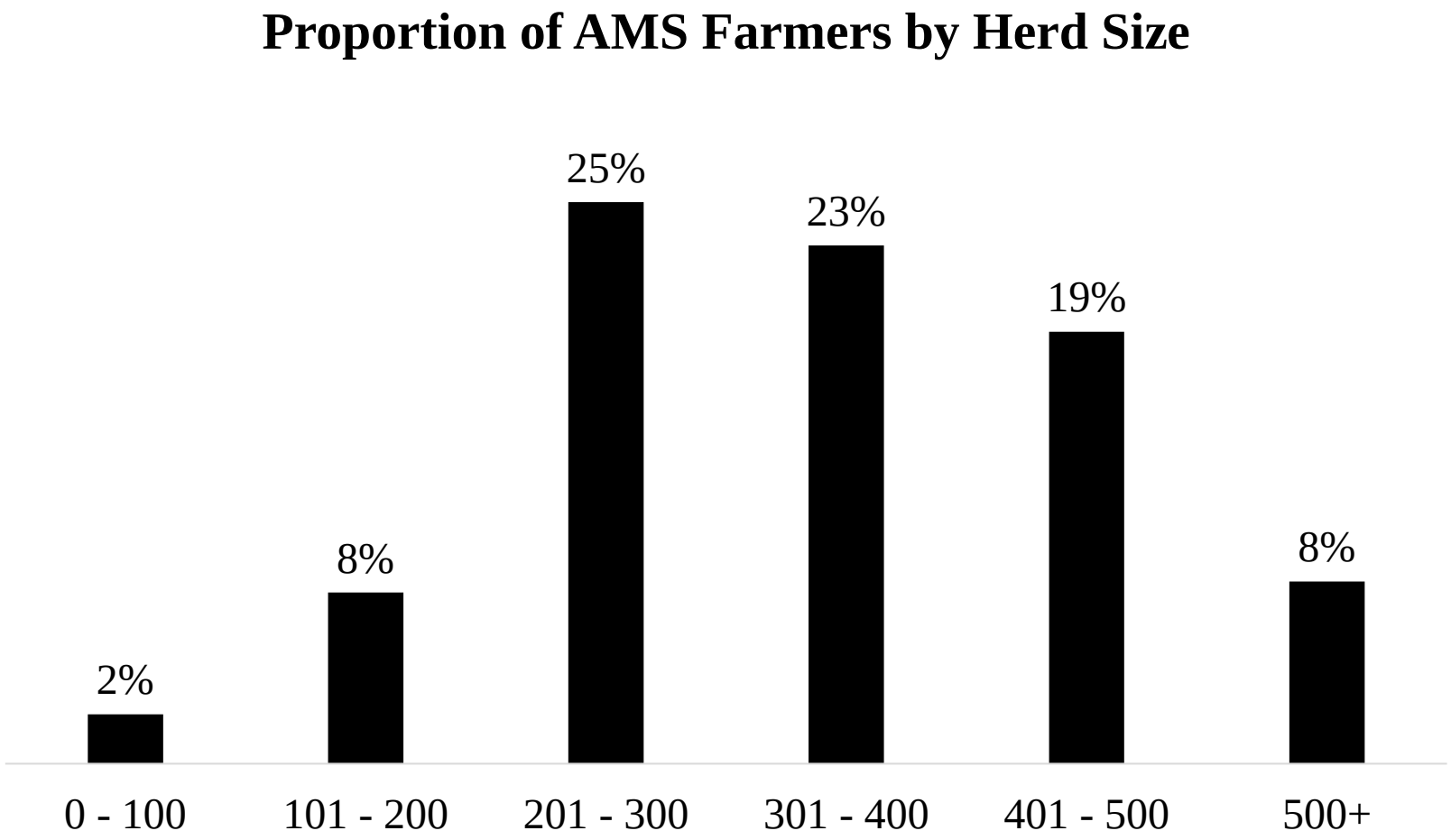
# Who Adopts AMS?



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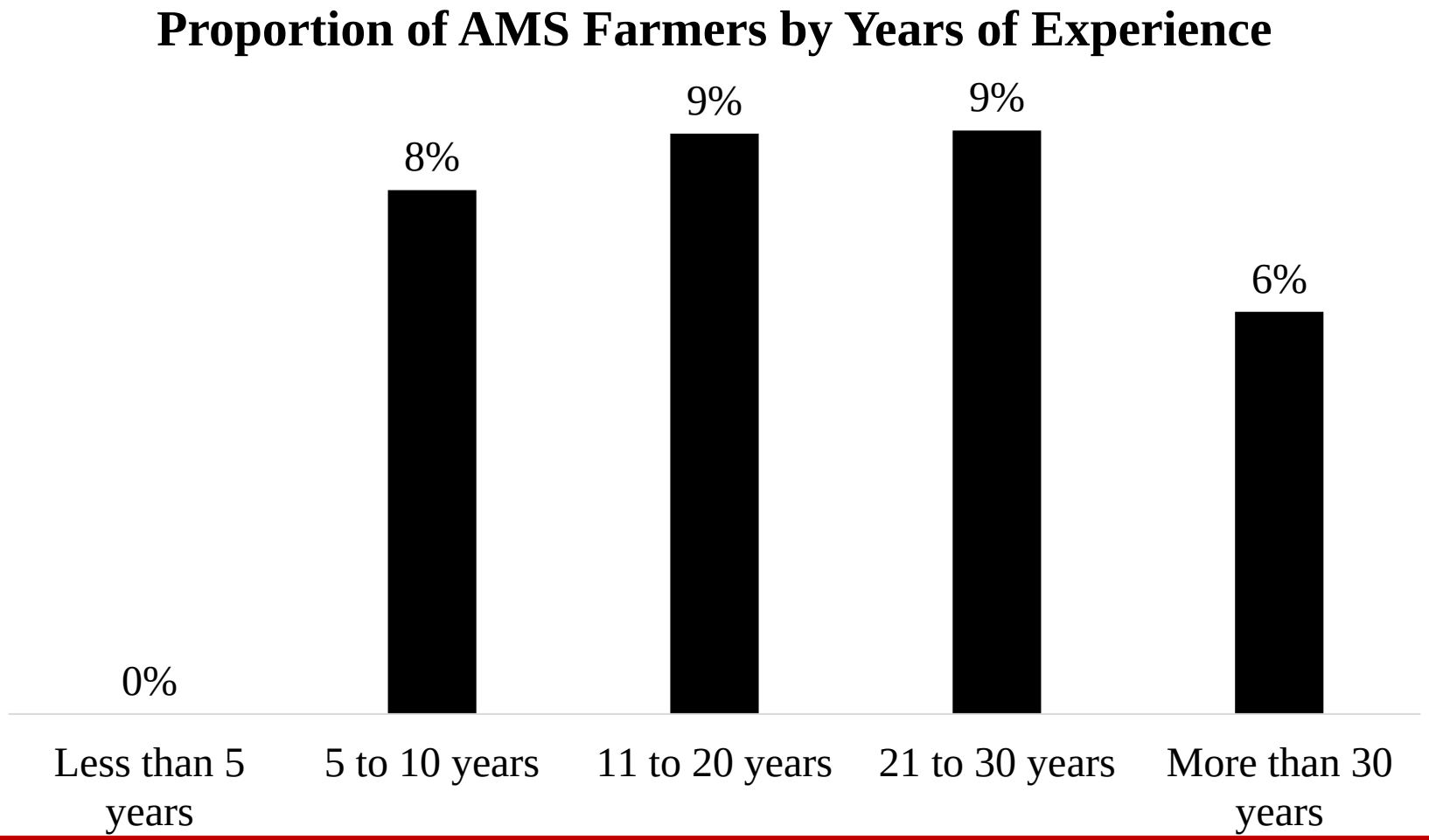

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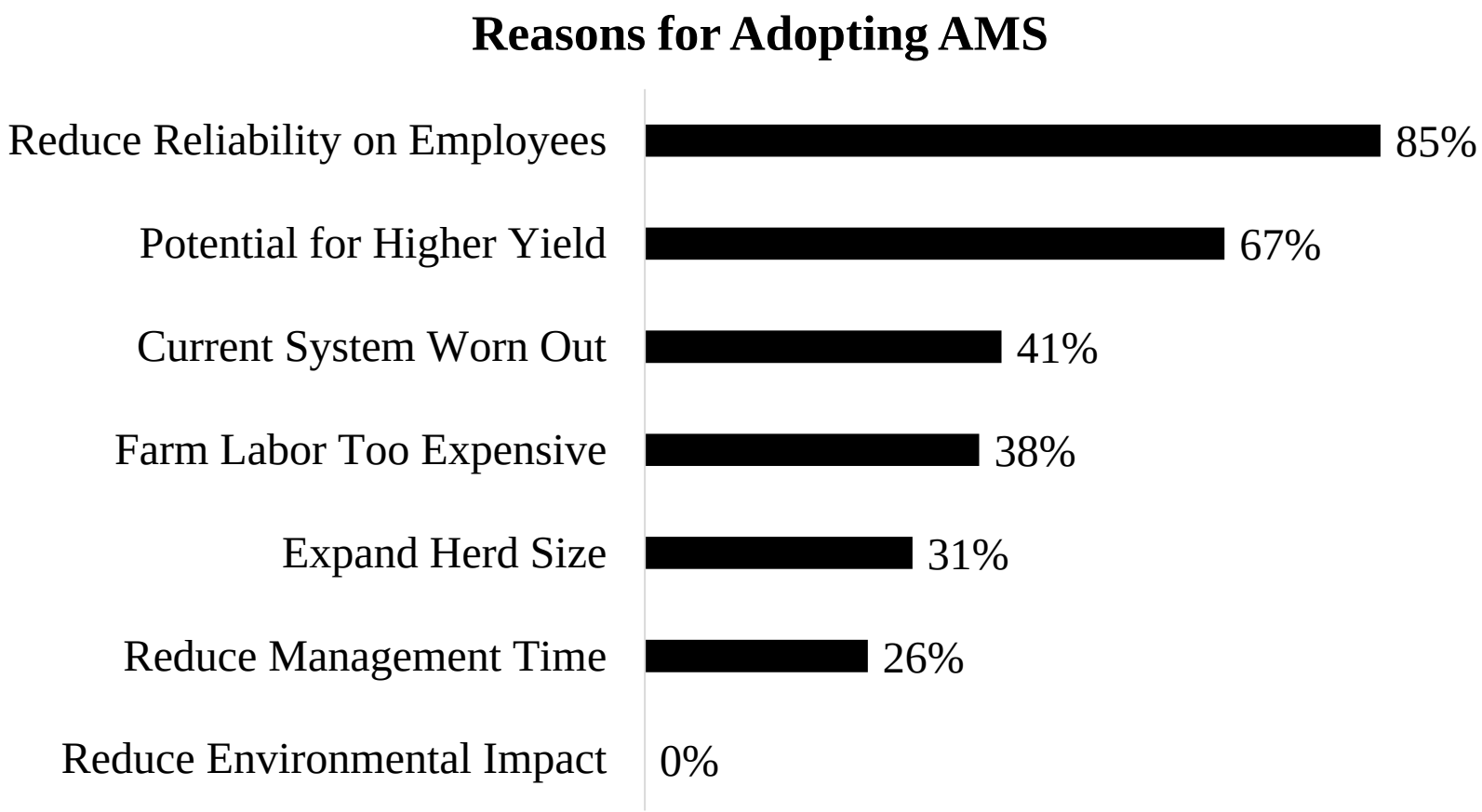
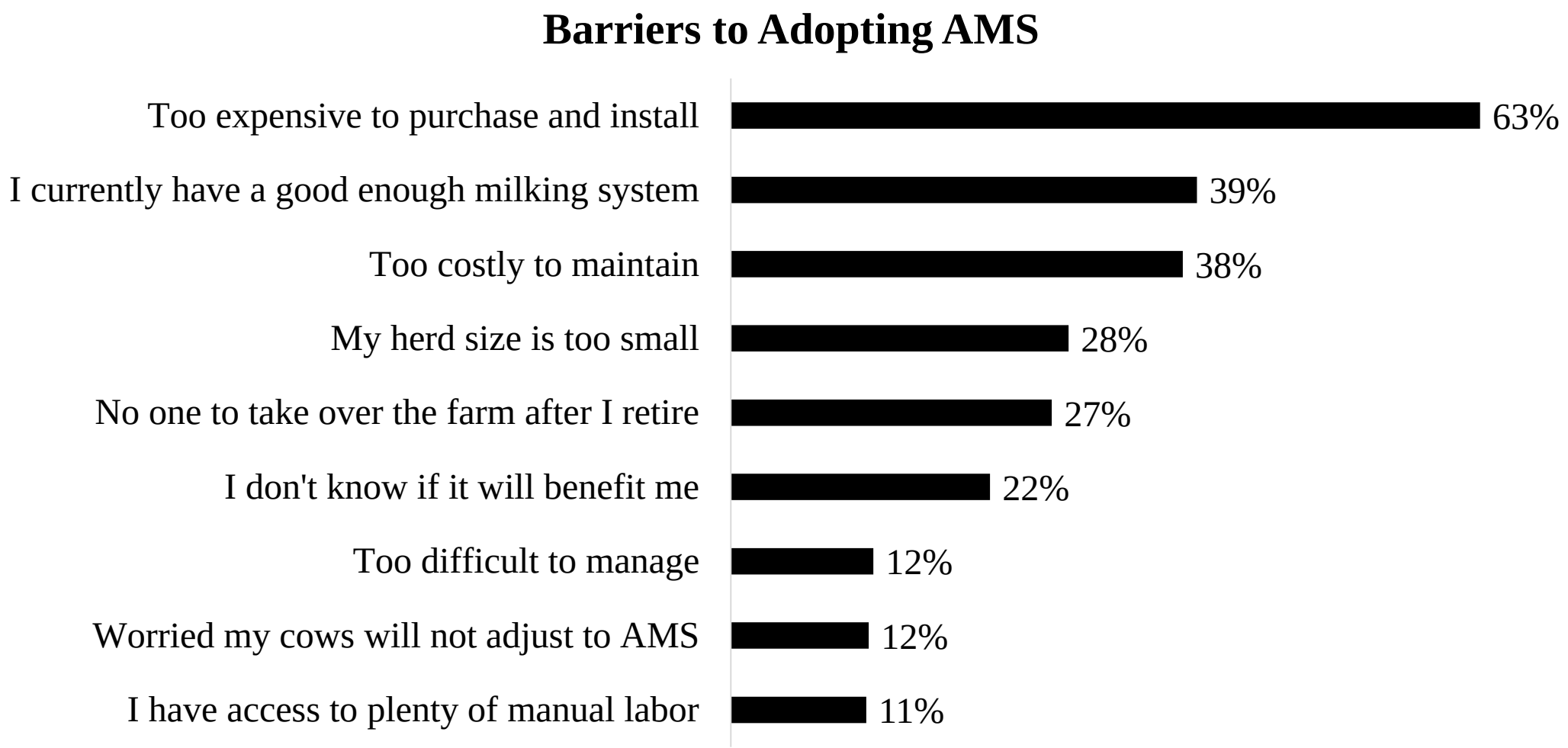
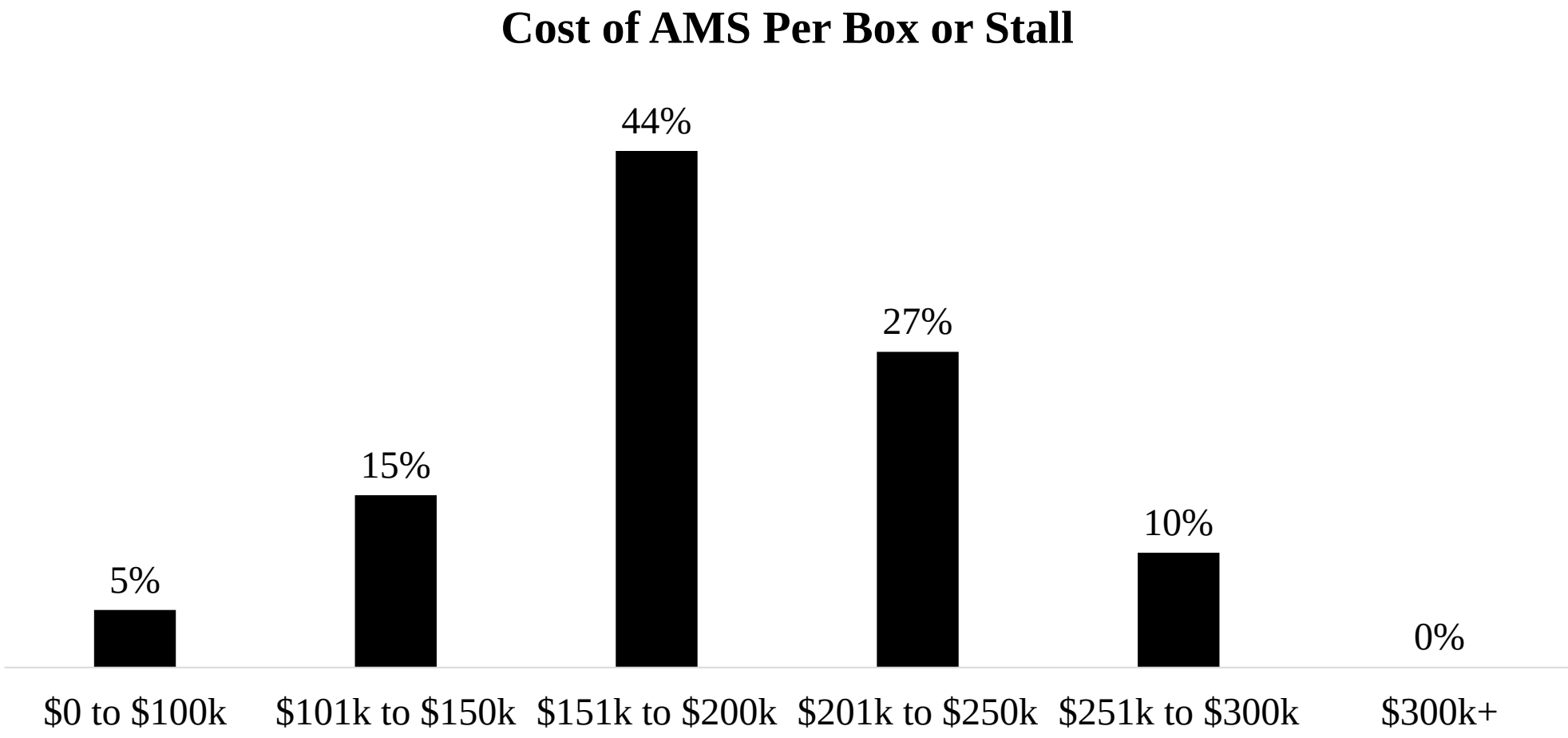


# Why Avoid AMS?



# Costs Involved in Adopting AMS



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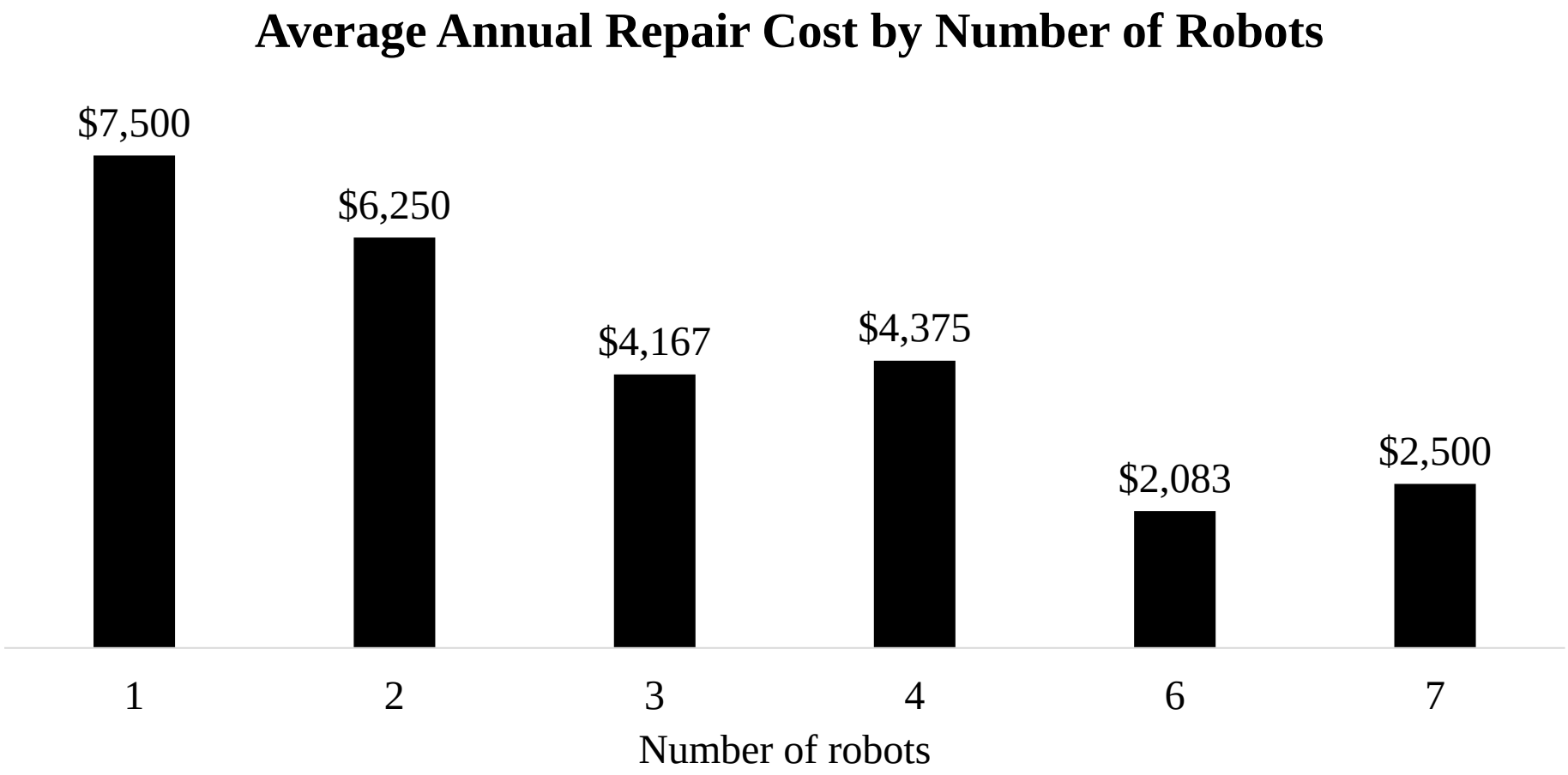

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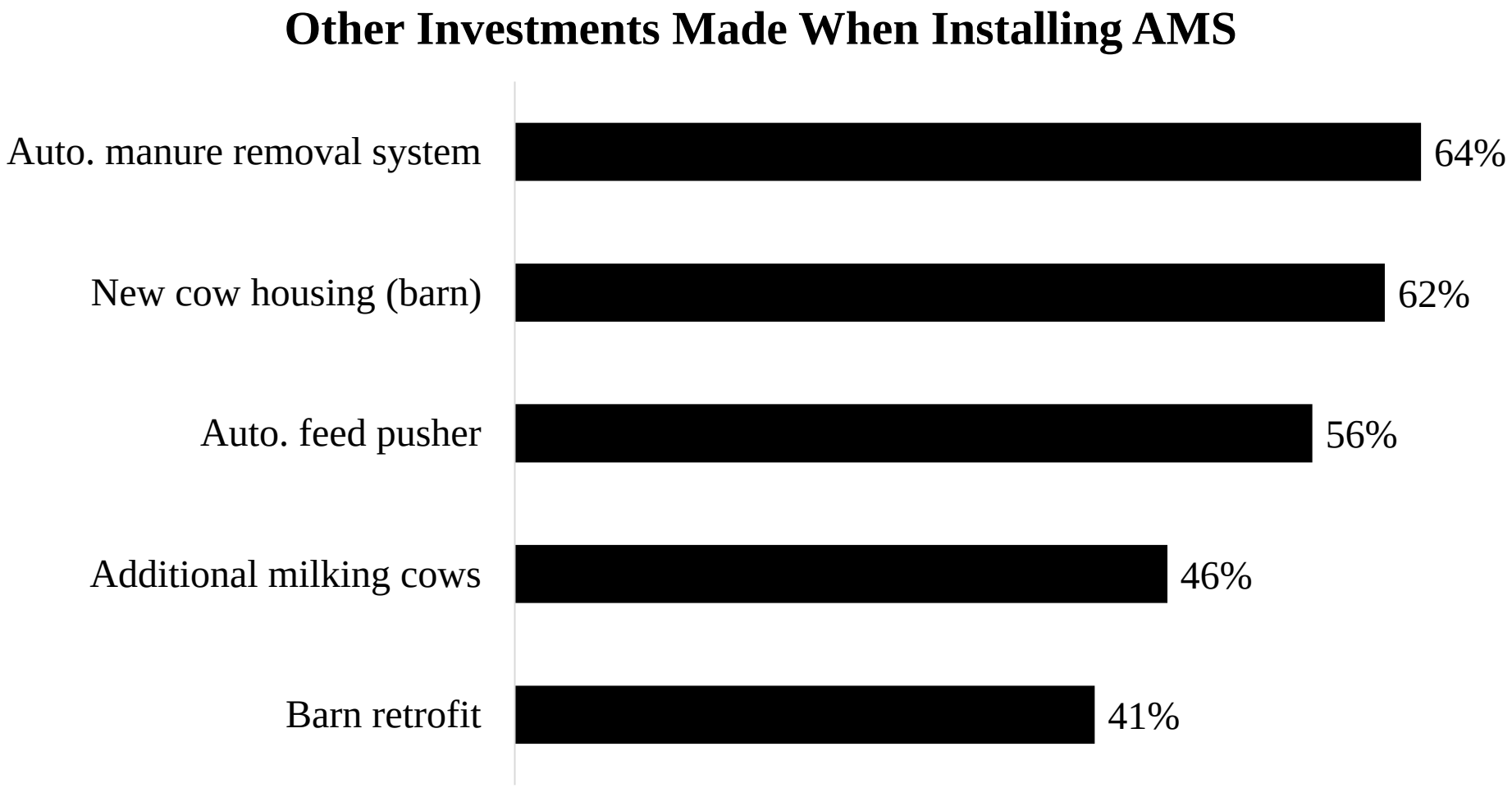
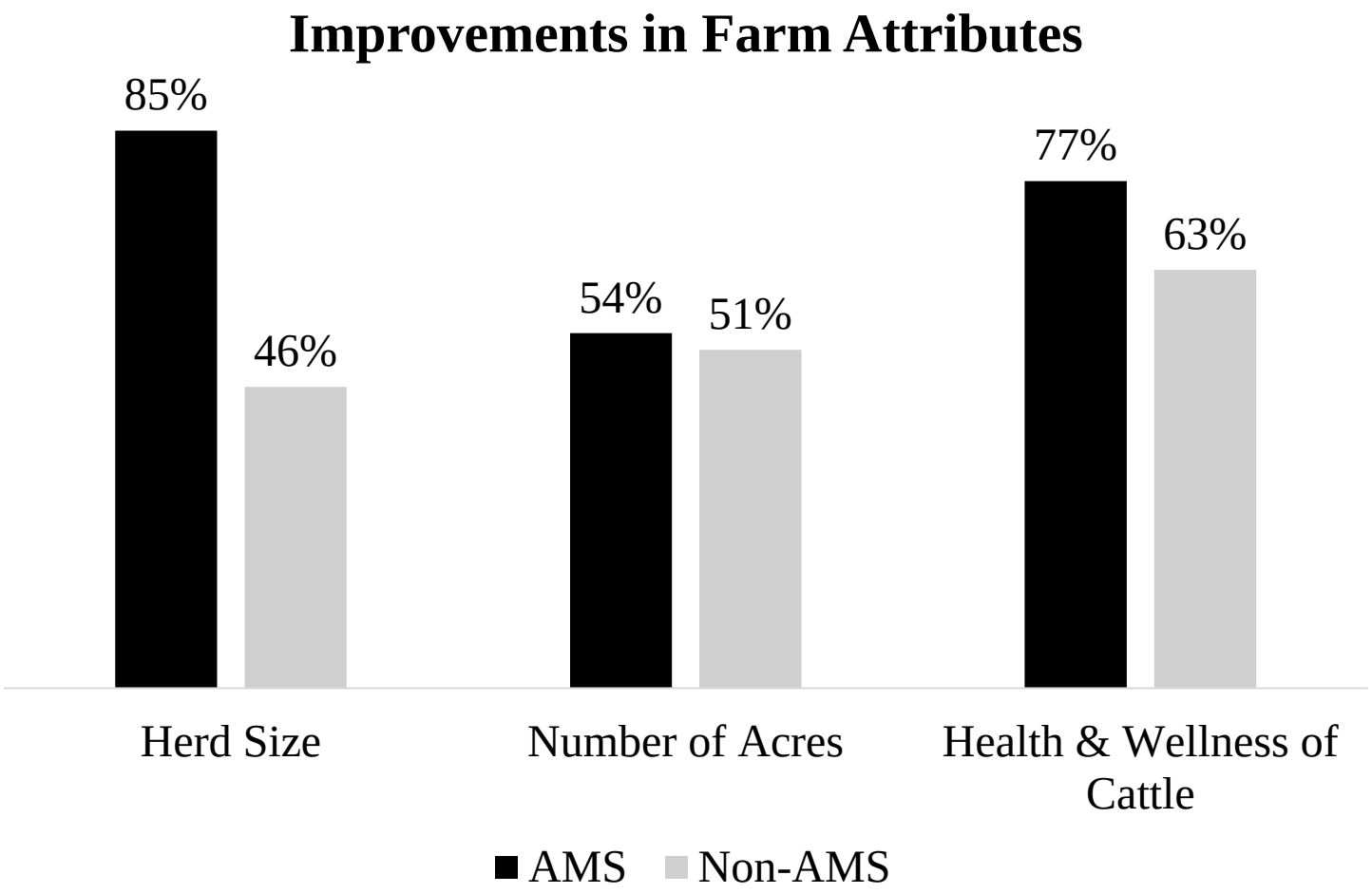


# Impact on Farm



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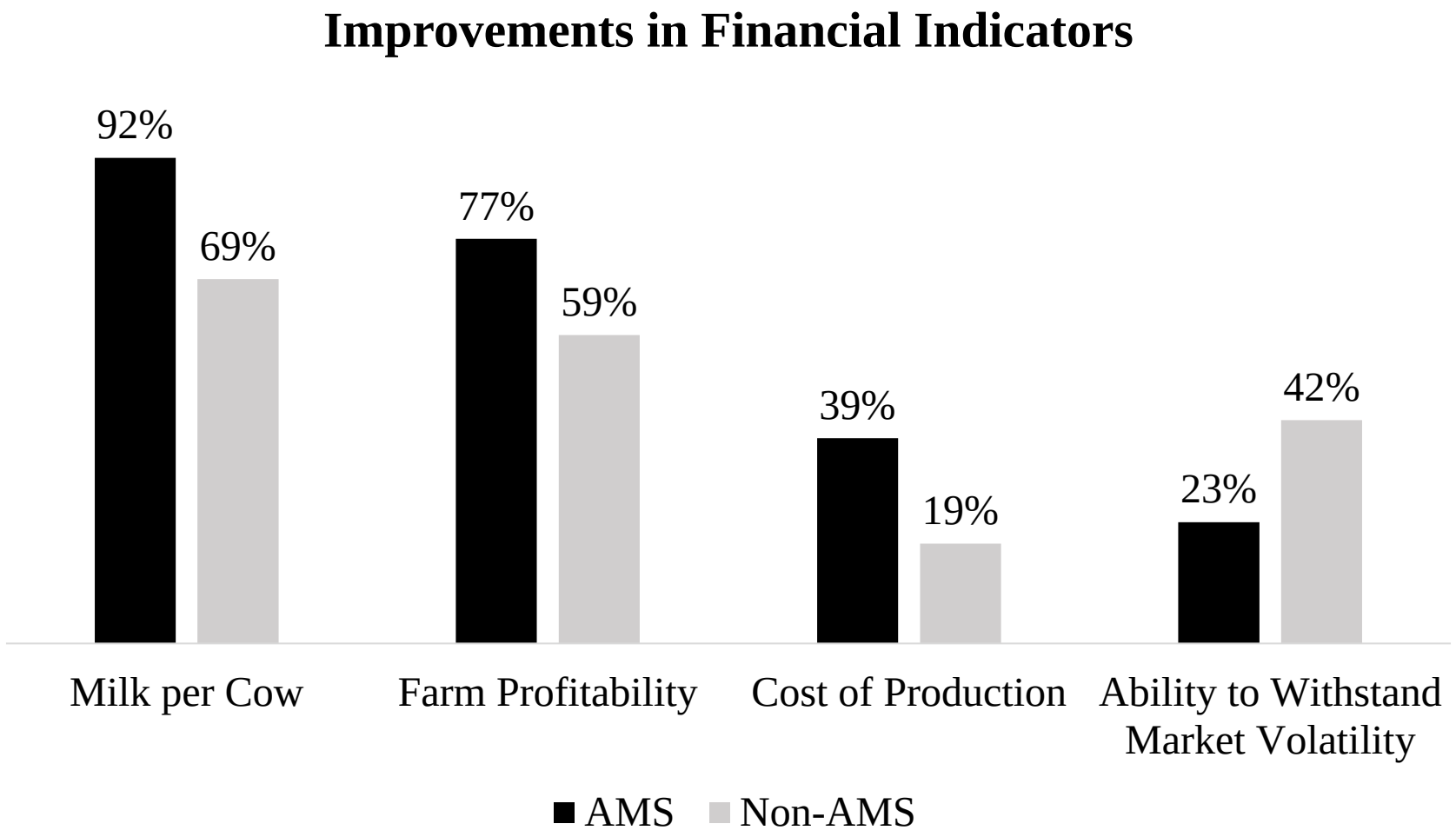

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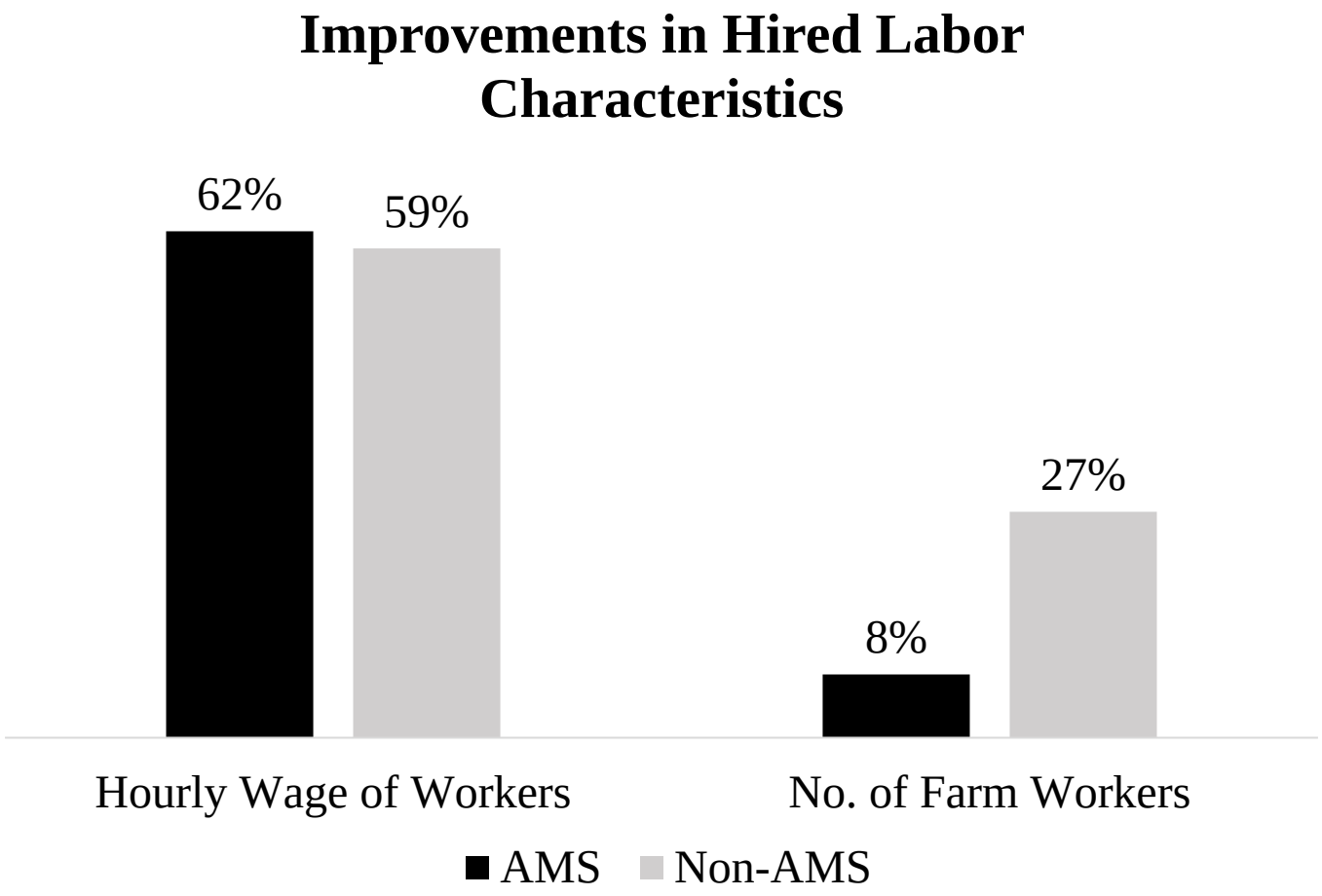

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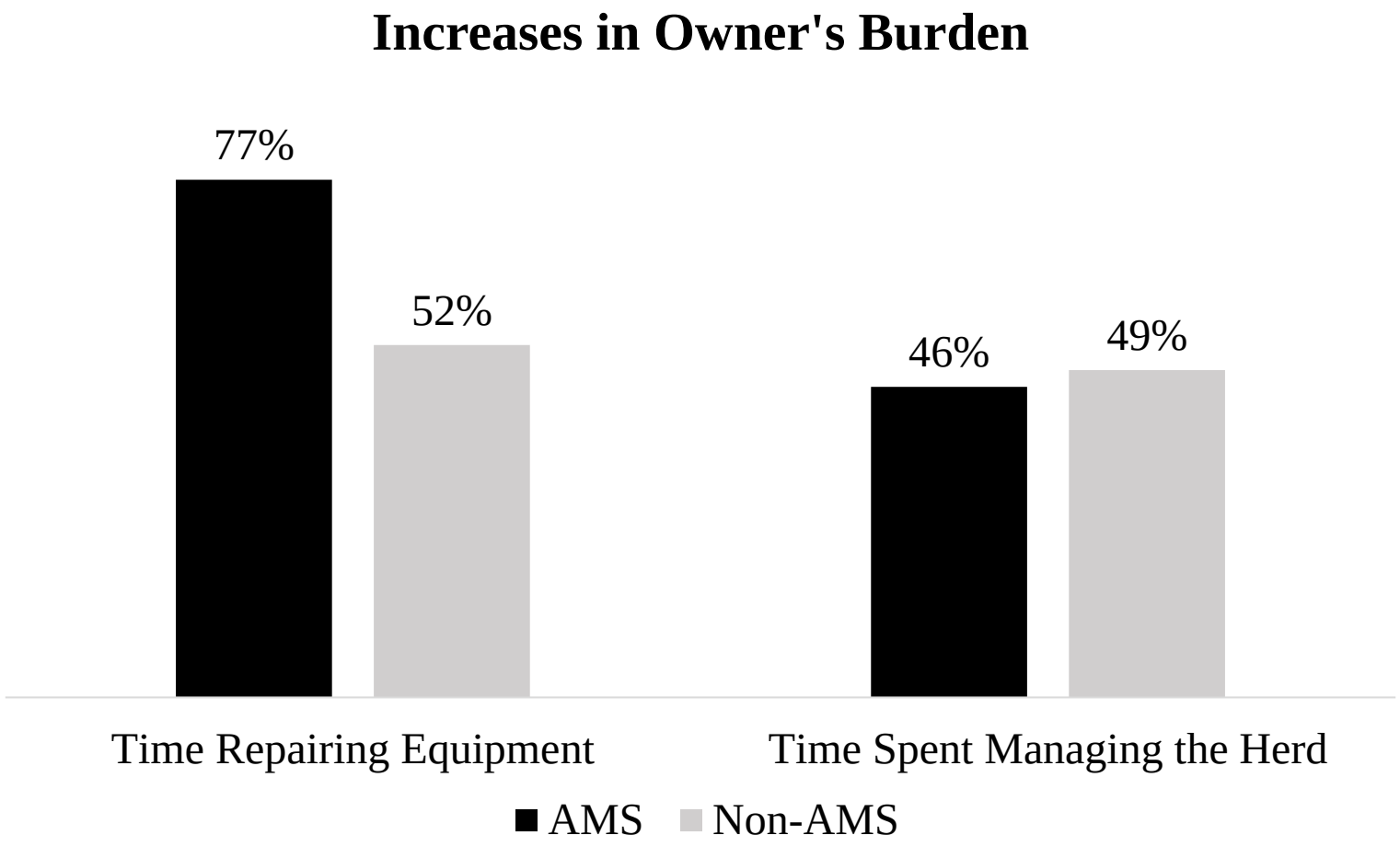
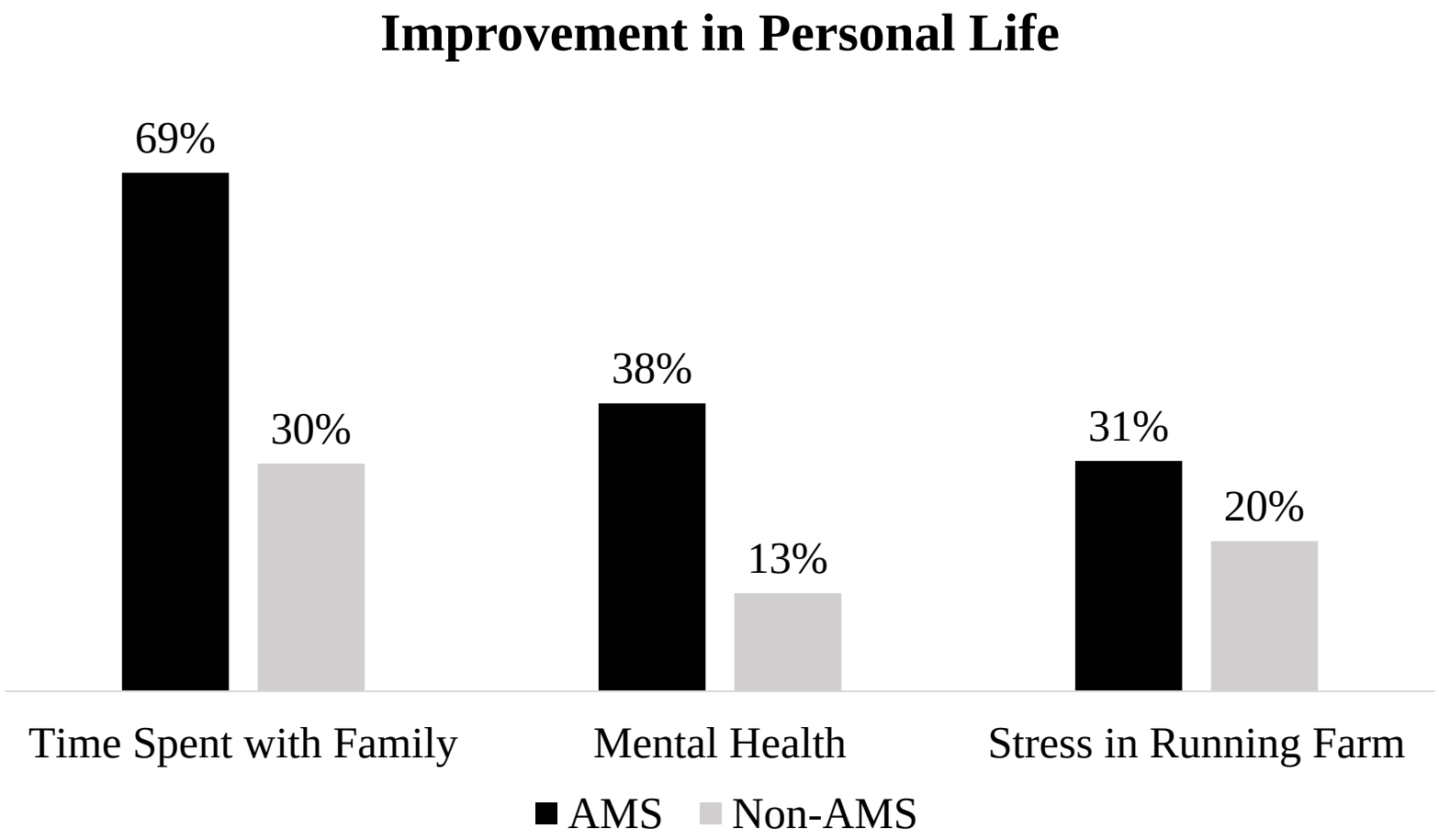


# Impact on Personal Life



# Conclusion

- In Wisconsin, AMS adoption is not commonplace.
- Labor market volatility is one of the main drivers of adoption.
- The biggest barrier to adoption is installation and maintenance cost.
- Relative to non-AMS farms, over the past 10 years farms with AMS have seen larger improvements in:
  - farm attributes (size, animal health),
  - financial metrics,
  - and farmers' quality of life.

| Descriptive Statistics | | |
|---|---|---|
| | N | % |
| Sample Size | 665 | 100% |
| AMS | 39 | 7% |
| Number of Acres | | |
| 0 - 100 | 81 | 22% |
| 101 - 200 | 81 | 22% |
| 201 - 500 | 125 | 34% |
| 501 - 1,000 | 62 | 17% |
| 1,000+ | 15 | 4% |
| Number of Cows | | |
| 0 - 100 | 277 | 54% |
| 101 - 200 | 106 | 21% |
| 201 - 300 | 40 | 8% |
| 301 - 400 | 26 | 5% |
| 401 - 500 | 26 | 5% |
| 500+ | 37 | 7% |

| Descriptive Statistics | | |
|---|---|---|
| | N | % |
| Organic Certified | 24 | 5% |
| Age of operator | | |
| 18 to 24 | 7 | 1% |
| 25 to 34 | 53 | 10% |
| 35 to 44 | 83 | 16% |
| 45 to 55 | 102 | 19% |
| 55 to 65 | 188 | 36% |
| 65+ | 94 | 18% |
| Annual Household Income | | |
| Under $15k | 26 | 5% |
| $15.1k to $35k | 82 | 17% |
| $35.1k to $50k | 71 | 15% |
| $50.1k to $75k | 98 | 20% |
| $75.1k to $100k | 72 | 15% |
| $100.1k to $150k | 53 | 11% |
| $150.1k to $200k | 32 | 7% |
| $200.1k+ | 49 | 10% |

| Descriptive Statistics | | |
|---|---|---|
| | N | % |
| Off-Farm Employment | 94 | 18% |
| Years of Experience | | |
| Less than 5 years | 7 | 1% |
| 5 to 10 years | 24 | 4% |
| 11 to 20 years | 66 | 12% |
| 21 to 30 years | 98 | 18% |
| More than 30 years | 347 | 64% |