

## Digital Technology Use on Wisconsin Dairy Farms

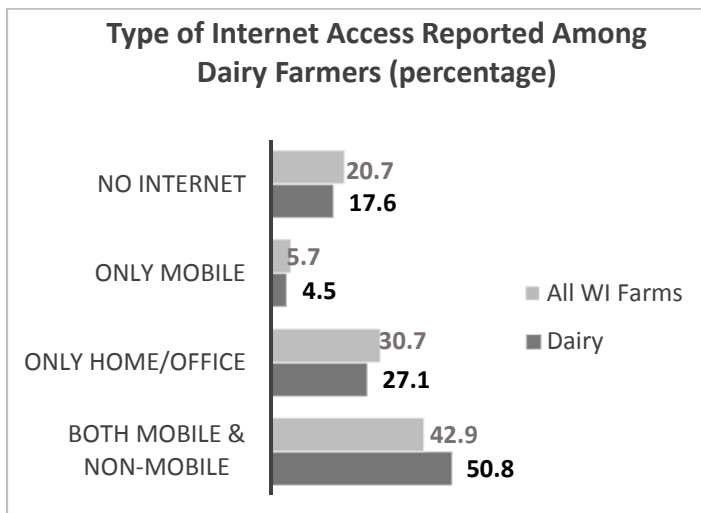
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### Introduction:

In 2018, we asked 3,000 Wisconsin dairy, livestock and crop farmers to participate in a survey about how they access and use the Internet. The study team asked about other categories of digital technology used on farms such as sensors, automation, precision agriculture equipment and smartphone apps. Barriers to digital technology adoption were studied including those connected to cost, privacy and security. Of the surveys delivered, 46% of the farmers responded. This fact sheet presents data for the 387 study respondents who indicated that their farm included a dairy enterprise. The median number of cows on these operations was 163 (compared to a statewide average of 134), with seven farms having 2,000 or more cows. Comparison data for ALL Wisconsin farms (not including dairy) that responded is also presented.

### Internet Access Among Dairy Producers

Just over half of dairy producers (50.8%) have both mobile internet access as well as home/office access such as DSL, satellite, etc. Only 4.5% had mobile Internet access as a sole source; 27.1% only used a fixed home/office connection (something other than mobile). A total of 17.6% reported that they did NOT have any Internet access which is slightly better than the 20.7% of non-dairy farmers who responded who reported none.



### Internet Satisfaction

Dairy producers gave satisfaction scores on factors such as speed (download and upload), reliability and cost for mobile and home/office Internet connections. Satisfaction scores were scaled from 1=Very Dissatisfied, 3=Neutral, and 5=Very Satisfied. Producers are slightly more satisfied with mobile Internet service and slightly more satisfied with upload speeds versus download speeds. Satisfaction was higher with download speed on a mobile device versus a non-mobile connection. This is not surprising as nearly 30% with a home/office connection receive service via DSL and 3.3% report using “dialup.” Average monthly cost for a bundled mobile Internet access plan as reported by dairy operators was \$157.80. The average bundled non-mobile plan (often with other features) was \$90.67

### Home/Office (non-mobile) Satisfaction Scores (1 = very dissatisfied; 3= Neutral; 5 = very satisfied)

Factor	Dairy	Other Farms
Service Reliability	3.54	3.50
Upload Speed	3.42	3.41
Data Cap Adequacy	3.40	3.48
Download Speed	3.26	3.29
Cost for Internet Access	2.87	2.87
Speeds During Peak Use	2.82	2.95
<b>OVERALL NON-MOBILE SATISFACTION</b>	<b>3.29</b>	<b>3.30</b>

### Mobile (including smartphones) Satisfaction Scores (1= very dissatisfied; 3=Neutral; 5=very satisfied)

Factor	Dairy	Other Farms
Upload Speed	3.61	3.54
Service Reliability	3.58	3.52
Download Speed	3.51	3.48
Connection Coverage in Area	3.43	3.33
Data Cap Adequacy	3.34	3.36
Speeds During Peak Use	3.27	3.29
Cost for Basic Mobile Plan	2.97	2.97
Cost of Mobile Data Plan	2.90	2.94
<b>OVERALL MOBILE SATISFACTION</b>	<b>3.40</b>	<b>3.34</b>

### How Are Farmers Using Internet Service?

Participants were asked about how often they use the Internet for certain activities and tasks. The percent of respondents who indicated that they did these items “often” or “always” can be seen in the following table.

Activity/Task	Percent Often/Always	
	Dairy	Other Farms
Access Weather Information	74.1%	69.1%
Access Market/Price Information	52.7%	51.1%
Complete Farm Paperwork	40.5%	29.7%
Download Data Files	30.5%	17.7%
Access Farm-Related Video Content	25.0%	17.2%
Upload Data Files (to vendors, consultants, etc.)	29.7%	17.3%
Access Online Software/Applications	29.4%	19.9%
Access Online Professional Development/Education	18.7%	15.6%
Access Information or Apply for Farm Programs	7.4%	6.5%

### Who Are Dairy Farmers Communicating with Using Digital Technology?

Dairy producers were asked about how often they use the Internet or their smartphone to contact/receive information from various categories of agricultural service providers. This includes use of email, text-messaging, videoconferencing, sharing digital photos, etc. The following table shows the percentage indicating that they used technology to communicate with these individuals either “most weeks” or “almost daily.”

Type of Agricultural Service Provider	Percent Contacting Most Weeks or Almost Daily	
	Dairy	Other Farms
Veterinarian	27.7%	4.9%
Other Farmers/Producers	24.4%	13.4%
Supply Vendor	21.6%	10.8%
Crop Consultant	20.7%	11.2%
Purchaser of farm’s products (coop, processor, etc.)	18.8%	12.1%
Farm Management Consultants	17.9%	4.3%
Lender, Accountant, Tax Professional	16.7%	8.0%
UW-Extension Personnel	4.5%	2.5%

### Other Types of Digital Information & Technology in Current Use

Survey respondents were asked to indicate which types of digitally-based information/technology platforms and categories they were actively using within their farming operation.

Type of Digital Information/Platform	Percent Using Often/Always	
	Dairy	Other Farms
Financial records	49.4%	34.9%
Smartphone apps for marketing	38.3%	25.6%
Market Information (e.g. DTN)	35.0%	35.8%
Precision Planting Equipment	19.3%	11.7%
Precision Harvesting Equipment	19.3%	14.6%
Sensor Data from Livestock	16.5%	1.7%
Driver-assisted Steering on Farm Equipment	14.1%	8.2%
Building or Storage Unit Sensors	10.8%	3.4%
UAVs/ Drones	8.5%	6.2%
Soil Sensor Data	4.9%	3.7%
Robotic Milking Machines	3.1%	0%

### Barriers and Obstacles to Dairy Farmers Adopting Digital Technology

Finally, dairy farmer participants had the chance to rank the importance of barriers to digital technology adoption. The question was (paraphrased) “How high a barrier is each of the following in terms of limiting your use of digital technology to support your farming operation?” We hope that these data illuminate some key areas for focus for educational programs, policy discussions and other changes that might be needed.

Issue/Barrier	Percent Citing Medium/High	
	Dairy	Other Farms
Security concerns (can anyone else access my data?)	65.3%	57.1%
Privacy concerns	63.7%	58.2%
Cost	55.8%	51.5%
Ability to keep up w/tech change	55.0%	54.4%
Lack of understanding how to understand/use the data	50.7%	50.1%
Lack of tech training opportunity	46.1%	44.9%
Poor local infrastructure (e.g. inadequate internet connections)	41.6%	39.3%
Compatibility of software/systems	40.4%	37.6%
Lack of interest	38.5%	38.7%
Lack of comfort with technologies	35.5%	53.4%
Lack of internet service providers	33.2%	32.3%
Lack of local hardware vendors	27.5%	24.1%
Lack of applicable software	22.7%	26.9%

## **Summary:**

It is the research team's hope that these data might be used to better inform conversations among all stakeholders who work within Wisconsin agriculture. There are still "digital divides" across the state based upon some of the variables described through data in this fact sheet. When we looked at ALL farmers who responded (nearly 1,100), we learned of other factors that are associated with Internet access and use. These include gender (women tend to be more likely to access/use the internet); age (people under 55 are more likely to use); education; income; and, farm size.

These data point to areas of opportunity for education and/or policy related discussions. Consistently, it seems that farmers are interested in technology use and applications, but often see barriers associated with security, privacy, and being able to derive value from the application of digital technologies and the information flows these technologies create. Members of the research team are willing to consult and advise on next steps as a part of this project.

## **Additional Discussion Questions:**

1. Is this what we "want" for our industry sector, community, or team?
2. If this is less than the "optimal" as we might define it, what are areas where we can make improvement?
3. What might we want to define as goals, targets, outcomes if we were to work to change this?
4. What would the benefits be if we were able to change this "snapshot" of what technology use and adoption looks like among dairy farmers?
5. Who do we need to engage? What types of partnerships would help us to move the needle?
6. The barriers might be thought of as roadblocks toward progress. How might we remove those roadblocks?
7. Farmers regularly communicate with a variety of groups using digital technology – Some groups regularly (like veterinarians and "other farmers") – Some groups, not so much (like Extension) – Is that okay? Are there leverage points to improve information flow and communication?
8. Dairy farmers do not use the internet for education or professional development as much as we might think. Yet, many organizations and institutions are assuming otherwise. Is that okay? Why or why not? Do we need to make changes to improve this?