

# Communication on the Dairy: Who Talks to Whom?

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## Introduction

Antibiotic resistance in food-borne bacteria is a serious public health problem and a major focus has been antibiotic use in animal agriculture. This project is using the dairy as a model system to study ways to address this problem. Previous research has shown that there are barriers to communication of prudent antibiotic use messages due to the size and complexity of larger modern dairies<sup>1</sup>. We will first investigate the networks of communication on dairy farms and then evaluate and determine effective ways of communicating prudent use messages to all levels of workers on dairies of different sizes. Here we present preliminary data from our first objective.

## Objectives & Hypothesis

**Objective 1** – Investigate dairy farmers' and workers' communication patterns and use and opportunities for teaching and training. Results from this first objective will be the basis of model development for effective training regarding prudent drug use in calf-rearing, and motivations and barriers to compliance with prudent use protocols.

Our hypothesis is that larger, more complex organizations have different mechanisms and challenges for communication and education of a new management policy or practice and require a different educational approach compared to smaller farms.



Figure 1. Owner discussing the calf operation.

## Material & Methods

Large ( $\geq 500$  cows) and small ( $\leq 300$  cows) dairies were enrolled to participate in the initial interviews. We targeted three to five workers at different levels on each dairy. Questionnaire development utilized expertise from veterinary epidemiologists, survey and communications sciences and practicing dairy veterinarians, with a focus on calf health and antimicrobial use. Four main areas targeted were:

- 1) Development of goals for feeding calves,
- 2) Daily routines related to feeding calves,
- 3) Developing the goals for calf health, and
- 4) Communicating about the daily work related to monitoring and treating disease.

## Material & Methods

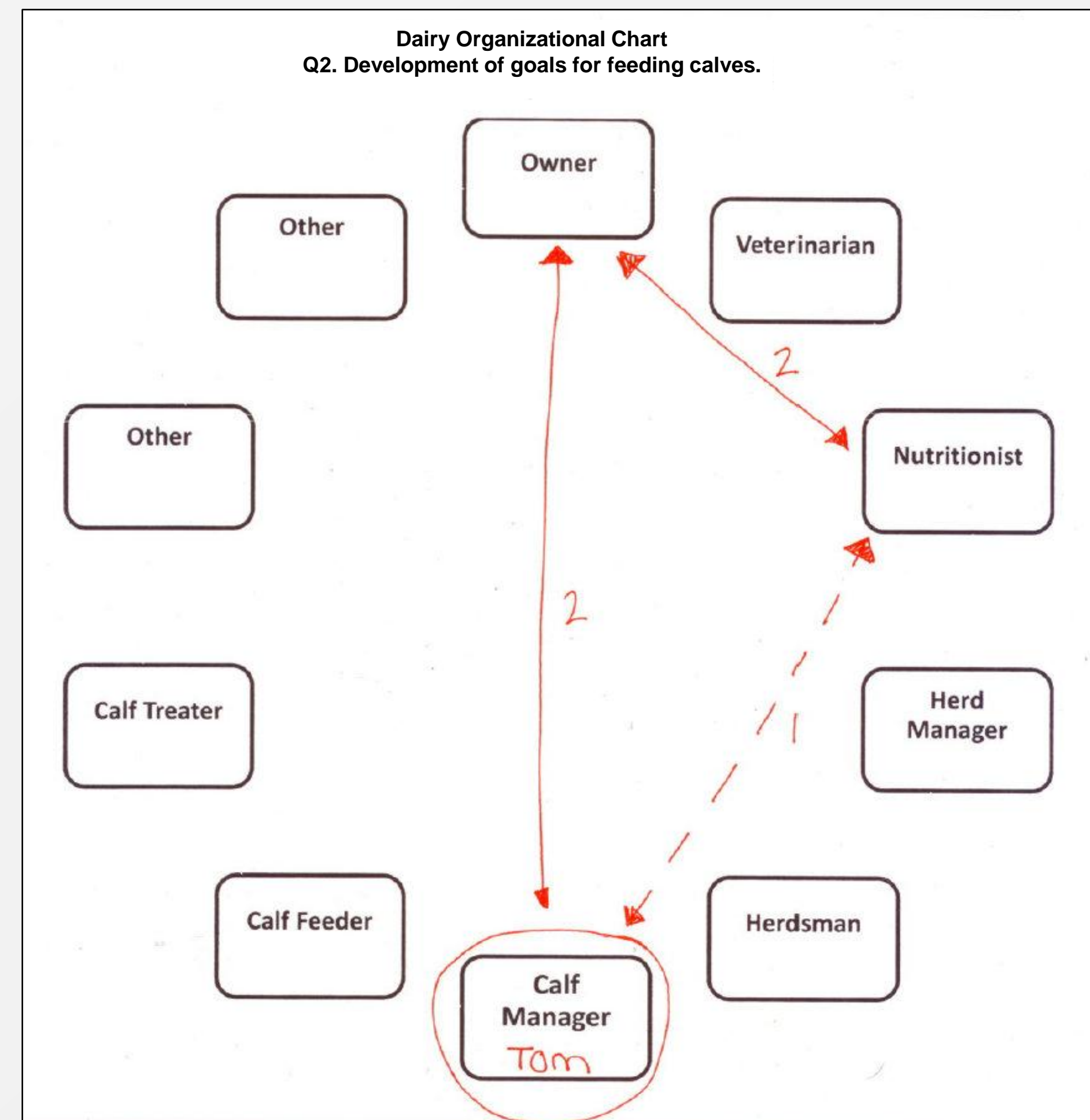


Figure 2. Flow chart for communication (4 charts). In addition to conventional questions, the interviewer filled out a flow chart for each of the targeted areas.

Dairy job definitions used in the survey/org chart:  
**Owner:** Person who owns the dairy and who may or may not be involved with the daily operations of the dairy.

**Veterinarian:** Licensed veterinarian who provides veterinary medical consulting and/or veterinary medical treatments and surgery on a regular basis.

**Nutritionist:** Qualified person who provides advice on animal diets, nutrition and feeding protocols and who helps formulate feeds for the dairy on a regular basis.

**Herd Manager:** Person who oversees all aspects of the dairy operation including (but not limited to) personnel, purchasing decisions, organization of animal and crop work objectives.

**Herdsman:** Person who oversees animal care activities (feeding, cleaning, treatments) for the milking herd and may also have oversight for calf and heifer care.

**Calf Manager:** Person who oversees all aspects of calf care.

**Calf Feeder:** Person who does the calf feeding tasks.

**Calf Treater:** Person who gives calf treatments.



Figure 3. Dairy workers feeding calves in Boardman, Oregon.

## Results

Table 1. Number of farms and interviews per state, and frequency of herd size.

State	# of Farms	# of Interviews	Frequency of Herd Sizes (# of calves)			
			0 - 49	50 - 100	101 - 300	301 - 1500
Arizona	3	15	0	0	0	3
Idaho	3	14	0	0	2	1
New York	23	112	9	7	7	0
Washington	21	85	4	5	4	8
<b>Total</b>	<b>50</b>	<b>226</b>	<b>13</b>	<b>12</b>	<b>13</b>	<b>12</b>

Table 2. Who are the dairy calf health teams (gender, age, language)?

Position	Gender		Age				Language at Home			Language Comfortable Communicating In					
	Female	Male	< 25	26-30	31-40	41-50	> 50	English	Spanish	Other	English	Spanish	French	Dutch	Other
Owner	9	43	0	1	14	16	22	53	0	0	49	14	1	5	2
Veterinarian	3	46	0	1	12	12	23	48	0	1	46	16	1	0	6
Nutritionist	0	1	0	0	0	1	0	1	0	0	1	0	0	0	0
Herd Manager	1	16	1	5	6	2	3	12	5	0	16	13	0	0	0
Herdsman	3	7	2	1	1	3	3	6	4	0	9	3	0	1	1
Calf Manager	5	25	5	7	7	6	5	10	19	1	21	27	0	0	0
Calf Feeder	2	34	13	12	7	3	1	8	28	0	22	29	0	0	0
Calf Treater	2	15	2	2	5	7	1	5	12	0	9	14	0	0	0
<b>Total</b>	<b>25</b>	<b>187</b>	<b>23</b>	<b>29</b>	<b>52</b>	<b>50</b>	<b>58</b>	<b>143</b>	<b>68</b>	<b>2</b>	<b>173</b>	<b>116</b>	<b>2</b>	<b>6</b>	<b>9</b>

Table 2 significance tests: no sig. diff. between proportion female of group A (owner to herd manager) and group B (herdsman to calf workers). Age distribution: Group A 111/119(93.3%) were older than 30 years, while in group B 49/93 (52.7%) were older than 30 ( $P < .001$ ). Language at home: 5/119 (4.2%) Group A spoke Spanish at home while 63/92 (68.5%) of Group B spoke Spanish at home ( $P < .001$ ).

Table 3. Who are the dairy calf health teams (highest level of education, continuing education)?

Position	Highest Level of Education									CE				
	None	K-8	Some high school	High school graduate	Community College (AA)	Technical/vocational school	Some college	University graduate (BABS)	Graduate or professional degree (Ph.D., DVM)	Last 6 months	6 months to 1 year	1 to 5 years	More than 5 years	Never attended
Owner	0	0	0	10	7	3	4	23	5	27	13	10	2	1
Veterinarian	0	0	0	0	0	0	0	0	48	42	2	2	0	0
Nutritionist	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Herd Manager	0	1	1	5	2	0	2	5	1	6	3	3	1	4
Herdsman	0	1	0	2	0	0	2	5	0	3	3	2	1	1
Calf Manager	1	9	1	8	1	3	2	5	0	10	3	10	2	5
Calf Feeder	1	12	10	8	1	2	2	0	0	9	4	3	2	18
Calf Treater	0	4	4	4	2	0	1	2	0	5	1	7	1	3
<b>Total</b>	<b>2</b>	<b>27</b>	<b>16</b>	<b>37</b>	<b>13</b>	<b>8</b>	<b>13</b>	<b>40</b>	<b>55</b>	<b>102</b>	<b>30</b>	<b>37</b>	<b>9</b>	<b>32</b>

Less than high school education: Group A= 2/69 (2.9%) and Group B=43/93 (53.8%), ( $P < .001$ ), (1, 2)

## Conclusions

- Language abilities and preference are not uniform across different job categories (Table 2).
- Education experiences are not uniform across different job categories (Table 3).
- Some of the decision makers in calf health, such as managers and treaters, have never attended a CE program (Table 3).
- On farm communication is dependent on having bilingual middle management.
- As expected, larger operations had more personnel with distinct job descriptions and middle management, but smaller herd operations also had specialization for calf care.
- From this qualitative research, we will construct a model of understanding for communication and education on complex-structured dairy operations that can enable the operation to more effectively implement science-based recommendations and respond to changing norms for animal care and antimicrobial use.

## References

1. Abramson, J. H. 2011. WINPEPI updated: computer programs for epidemiologists, and their teaching potential. *Epidemiol Perspect Innov* 8:1.
2. Rosenberg, H. R., and P. Cowen. 1990. Management differences and dairy results. *Agribusiness* 6:267-279.

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