

Responding Quickly to an Issue: A Collaborative Approach to Drug Residue Prevention

Abstract

Responding to current issues requires Extension educators to quickly react and collaborate. The Washington Department of Agriculture requested help developing and conducting outreach programs on dairy cattle drug residue prevention as a result of a new program announced by the US FDA. Curriculum focused on causes of residues and improving treatment records. Five face-to-face sessions with over 180 farmers and veterinarians and 360 views of an online program indicated interest. Over 65% of attendees intended to review their treatment protocols. A concomitant reduction in residue violations from dairy animals in the state was seen after the programs.

Dale Moore

Professor
College of Veterinary
Medicine
Washington State
University
Pullman, Washington
damoore@vetmed.wsu.edu

John Wenz

Associate Professor
College of Veterinary
Medicine
Washington State
University
Pullman, Washington
jrwenz@vetmed.wsu.edu

Claudia Coles

Administrator, Office
of Compliance and
Outreach
Food Safety and
Consumer Services
Washington State
Department of
Agriculture
Olympia, Washington
ccoles@agr.wa.gov

Paul Kohrs

Acting State
Veterinarian
Washington State
Department of
Agriculture
Olympia, Washington
pkohrs@agr.wa.gov

Introduction

In 2010, the US Food and Drug Administration (FDA) announced they would increase testing scrutiny of milk due to residues seen in cull dairy cow tissues (Lee, 2010). Every tanker load of milk is tested for beta-lactam antibiotics. Because many tissue violations were from residues from other drugs, the agency intended to test milk for drugs such as anti-inflammatories and other antibiotics. Dairy farms with repeat residue violations were the focus of FDA testing.

After initial announcement of FDA's new program, dairy organizations, processors, veterinarians, and magazines provided information on the program to producers. Although residue violators were the focus, the announcement sparked general interest in the industry. The Washington State Department of Agriculture (WSDA) contacted the dairy industry and Washington State University (WSU) Extension about collaborating on producer education on residue prevention. This article describes collaborations for curriculum development, program delivery, and educational opportunities discovered as a result of the program.

Collaborations and Curriculum Development

The WSDA pulled together Extension and dairy organizations and led presentations on the FDA testing program. Extension was contracted to coordinate activities and provide specific drug use and animal health content. Dairy organizations and a pharmaceutical company provided monetary and recruitment support.

The WSDA shared summary data from FDA focused on western cattle residue violations (Table 1). Most violations were from dairy cattle and bob veal (calves slaughtered within a few days of birth). In reviewing reasons for residues (Kaneene & Alwynelle, 1987; Gibbons-Burgener, 1999), education needed to focus on extra-label drug use and record-keeping. Word from the field was that many veterinarians and producers were already reviewing their treatment protocols but still had questions about testing processes and consequences and specific reasons for residues seen in dairy cattle.

Table 1.

Summary of 12 Months of Tissue Residue Violations in Cattle by Class and Drug in AZ, CA, ID, OR, WA, July 2009 – June 2010 (US Food and Drug Administration Data)

Drug Name	Bob Veal	Bulls/ Stags	Cows Beef	Cows Dairy	Heavy Calves	Heifers	Steers	Total
Ampicillin			1	3				4
Desfuroylceftiofur*	1			29				30
Flunixin	1		1	65			1	68
Gentamicin	2			9	2		2	15
Ivermectin		2						2
Neomycin	36			6	2		1	45
Oxytetracycline	1			11				12
Penicillin				102				102
Sulfadimethoxine	2			77			1	80
Sulfamethazine				20			5	25
Sulfamethoxazole	2							2
Tetracycline				11				11
Tilmicosin				4		1	1	6
Tylosin	1							1
Total	46	2	2	337	4	1	11	404
*A metabolite of the antibiotic ceftiofur.								

To address these needs, the curriculum attempted to answer the following.

- What is FDA's concern and their plan for milk testing? What are current drug residue issues? WSDA.
- What are major reasons for residues from specific drugs found in market dairy cow tissues and how does that inform prevention? WSU.
- How can "Good Health Records" reduce the number of cows needing treatment, determine if treatments are working, and better track drug withdrawal times? WSU.
- What are current requirements for non-ambulatory cows and what role do they play in food safety? WSDA.

Program Delivery

Meeting advertising was conducted by all collaborators with a target audience of producers, herd managers, and veterinarians. Five meetings were held March through April, 2011. At each meeting, producers received the *Milk and Dairy Beef Drug Residue Prevention Manual* (National Milk Producers Federation, 2011) and information about an online market cow program for employees (Dalton, Moore, & Poe, 2007).

An audience response system (ARS) (Turning Point®, Turning Technologies, Youngstown, OH) was used to gauge current knowledge and practices and intention to change (Salmon, 2005). Data from the ARS was summarized in a computerized spreadsheet (Table 2).

Table 2.

Audience Responses during and Just After a Presentation on Reasons Seen for Drug Residues in Dairy Cattle

During the presentation	Correct Answers (Total responses)	% Correct Answers
Drug withdrawal times are based on:	68 (104)	65%
The reason we see so many bob veal calves with residues is because these calves:	23 (109)	21%
The major reason a cow might have a flunixin residue is because they were given the drug:	92 (106)	86%
The most likely reason cows might have a penicillin residue is because the drug was given:	104 (108)	96%
The most likely reason for a desferoxyloxytetracycline residue in a cow is:	43 (100)	43%
Which (sulfa) drug can I legally use in a lactating cow?*	56 (95)	59%

After the Presentation	Strongly Agree	Agree	Disagree	Strongly Disagree
As a result of this program, I am likely to talk with my veterinarian about farm drug use.	60 (63%)	31 (33%)	2 (2%)	2 (2%)
As a result of this program, I will talk with employees who handle drugs on my farm.	75 (77%)	21 (22%)	1 (1%)	0
As a result of this program, I will take another look at my treatment records.	77 (69%)	31 (28%)	3 (3%)	0

For those unable to attend the meetings a narrated slide set covering reasons for residues was posted online <<http://breeze.wsu.edu/p42969801/>>. Website "hits" to the course page were evaluated.

Results

More than 180 producers, dairy employees or veterinarians attended. Over 130 audience members responded at least once using the ARS (Table 2). Most participants were aware that giving an extra-label dose of penicillin was a primary reason for residues, but few knew that a common reason for residues in bob veal was feeding milk replacers medicated with neomycin. With regards to "intent-to-change," over 63% strongly agreed that they were likely to talk to their veterinarian about farm drug use as a result of the program, and more than 75% strongly agreed that they would talk with employees who handle drugs on their farm. Over 65% strongly agreed that they would take another look at their treatment records.

Most ARS records questions sought information on current practices and treatment record quality (Table 3). Although most (68%) responded that their records could answer individual cow treatment or culling questions, only 39% thought they could provide all the information needed during a residue violation investigation. When provided rules of good record-keeping, 94% indicated they may or probably would implement them and a third would probably contact someone about implementing good health records.

Table 3.

Audience Responses to Questions Imbedded in a Presentation on Dairy Cow Health and Treatment Records Necessary for Residue Avoidance

--	--	--

Question	Number	Percent
Which dairy management software is used on your dairy?		
None	20	20%
DC305	38	38%
DHI Plus	20	20%
Dairy Plan	12	12%
Other	9	9%
Can your health records answer individual cow treatment or culling questions?		
Yes	65	68%
No	20	21%
Don't Know	10	11%
Can your health records answer cow ID, treatment date, drug used, dose given, route of administration, withdrawal time for meat and milk, individual who administered drug, if recommended by a veterinarian, date animal can be slaughtered or milk can be used?		
Yes	33	39%
No	46	54%
Don't Know	6	7%
Can your health records answer the question: Why was the drug given?		
Yes	45	54%
No	37	44%
Don't Know	2	2%
Can your health records determine % clinical mastitis requiring re-treatment last month?		
Yes	49	52%
No	35	37%
Don't Know	11	12%
Do you currently use Treatment Tracking Tools (DC305 Protocols or RxPlus)?		
Yes	20	45%
No	24	55%
How likely are you to implement the Rules of Good Recording?		
Probably Will	78	77%
Maybe Will	17	17%
No Chance	6	6%
How likely are you to contact us about being a Demo Herd or for help		

achieving "Good Health Records?"		
Probably	32	34%
Maybe	44	46%
No	19	20%

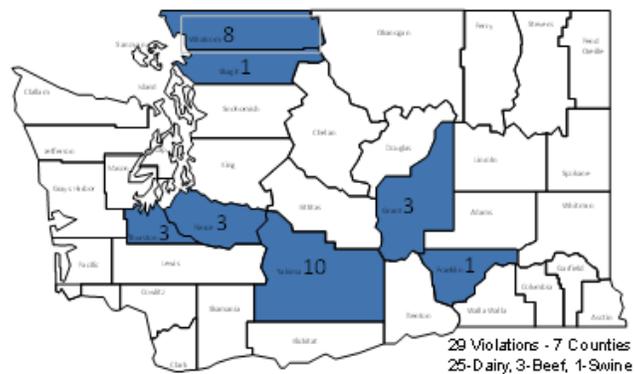
An additional program with over 55 attendees was conducted in Idaho. An article was written about the website presentation by *Bovine Veterinarian* magazine (October 2011, Pg. 21), with a print readership of over 10,000. The online presentation had over 360 views July, 2011, to April, 2012.

The number of tissue residues reported from the state declined after the programs. There were 25 dairy cow tissue residue violations before the meetings, nine the year after, and zero the following year (Figure 1).

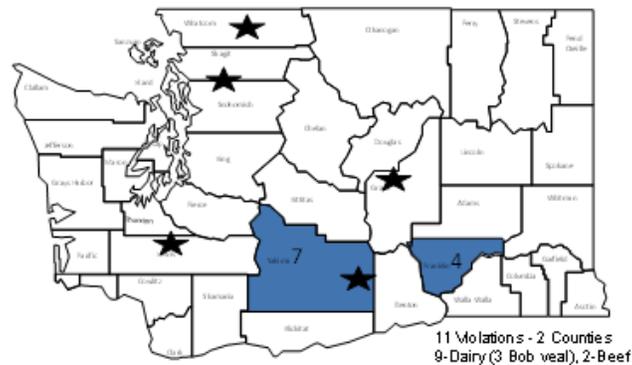
Figure 1.

Meat Drug Residue Violations Reported by the US Food and Drug Administration by County from April 2009 Through April 2012, in Washington State and Locations of Residue Prevention Producer Meetings

a. Meat Residue Violations April 2009 – May 2010



b. Meat Residue Violations May 2010 - April 2011



*Star represents location of residue prevention meetings held March-April, 2011.

c. Meat Residue Violations April 2011-March 2012



Discussion

Collaborations among state government, industry, and Extension can quickly address an important issue and not only bring different resources but also promote consistent messages (Moore et al., 2004). Although the program did not reach everyone who might need the information, it did reach someone from about 25% of the state's dairy farms. The coincidental decline in residues in the state could be attributed to outreach programs or media attention and concomitant implementation of new drug use practices.

The ARS identified educational opportunities on good health and treatment records. Because few attendees understood sulfa-drug issues, a subsequent Extension article was written about reasons for sulfa-drug residues (Moore, 2011).

The inability of many farmers' treatment records to provide information needed in an investigation puts them at risk for punitive action, even if they follow all the rules. Poor documentation is a major reason for drug residues (Kaneene & Alwynelle, 1987). As a result of the program described here and investigations into health records (Wenz & Giebel, 2012), a program to help dairy farmers and veterinarians assess and improve record quality was launched <<http://www.goodhealthrecords.com>>.

Conclusion

Extension, in collaboration with government and industry, can quickly and effectively meet specific educational needs of farmers. Using data to identify learning needs and providing specific answers to producer questions could result in real impacts within the industry. The program described here could serve as a model of a collaborative effort.

Acknowledgments

The project was supported through a contract with the Washington State Department of Agriculture. Special thanks to Sandy Poisson for technical support and the Washington State Dairy Federation, Northwest Dairy Association, and Pfizer Animal Health (now Zoetis).

References

- Dalton, J. C., Moore, D. A., & Poe, M. L. (2007). Promoting a consistent food safety and quality message to the dairy industry: An updated resource for extension faculty, veterinarians, and dairy advisors. *Journal of Extension* [On-line]. 45(1). Article 1TOT4. Available at: <http://www.joe.org/joe/2007february/tt4.php>
- Gibbons-Burgener, S. N., Kaneene, J. B., Lloyd, J. W. & Erskine, R. J. (1999). Evaluation for certification in the Milk and Dairy Beef Quality Assurance Program and associated factors on the risk of having violative antibiotic residues in milk from dairy farms in Michigan. *American Journal of Veterinary Research*. 60(10),1312-1316.

- Kaneene, J. B., & Alwynelle, S. A. (1987). Drug residues in dairy cattle industry: epidemiologic evaluation of factors influencing their outcomes. *Journal of Dairy Science*. 70(10), 2176-2180.
- Lee, K. (2010). FDA announces its plan to sample milk for drug residues. *Progressive Dairyman*. Dec 6, 2010. Retrieved from: http://www.progressivedairy.com/index.php?option=com_content&view=article&id=7689:fda-announces-its-plan-to-sample-milk-for-drug-residues&catid=45:herd-health&Itemid=71
- Moore, D. A., Kirk, J. H., Klingborg, D. J., Garry, F., Wailes, W., Dalton, J., Busboom, J., Sams, R. W., Poe, M., Payne, M., Marchello, J., Looper, M., Falk, D., & Wright, T. (2004). Dairy beef: Maximizing quality and profits-A consistent food safety message. *Journal of Dairy Science*. 87:183-190.
- Moore, D. A. (2011). Why do we sulfa drug residues in dairy cattle? *Ag animal health*. Summer 2011. Retrieved from: <http://extension.wsu.edu/vetextension/Documents/Summer2011.pdf>
- National Milk Producers Federation. (2011). *Milk and dairy beef drug residue prevention producer manual of best management practices*. National Milk Producers Federation: Arlington, VA. 55 pp. Retrieved from: http://nationaldairyfarm.com/sites/default/files/2013%20Residue%20Manual_WEB.pdf
- Salmon, T. P., & Stahl, J. N. (2005). Wireless audience response system: Does it make a difference? *Journal of Extension* [On-line], 43(3):3RIB10 Available at: <http://www.joe.org/joe/2005june/rb10.php>
- US Food and Drug Administration. (2005). Attachment C-Tissue residue evaluation form. In: *Compliance program guidance manual*. p61. Retrieved from: <http://www.fda.gov/downloads/AnimalVeterinary/GuidanceComplianceEnforcement/ComplianceEnforcement/ucm113433.pdf>
- Wenz, J. R., & Giebel, S. K. (2012). Retrospective evaluation of health event data recording on 50 dairies using Dairy Comp 305. *Journal of Dairy Science*. 95(8), p4699-4706.

Copyright © by *Extension Journal, Inc.* ISSN 1077-5315. Articles appearing in the Journal become the property of the Journal. Single copies of articles may be reproduced in electronic or print form for use in educational or training activities. Inclusion of articles in other publications, electronic sources, or systematic large-scale distribution may be done only with prior electronic or written permission of the *Journal Editorial Office*, joe-ed@joe.org.

If you have difficulties viewing or printing this page, please contact [JOE Technical Support](#)