




Impact of feed management software on feeding management and whole farm nutrient balance.


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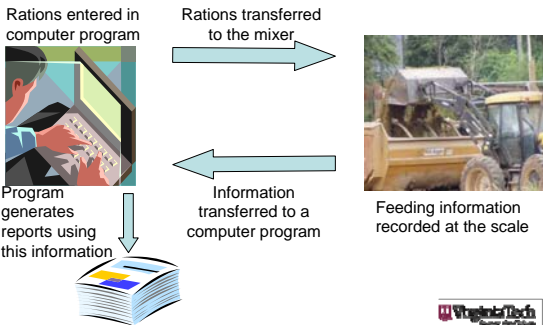
Intensive Feed Mgmt 2006




- 10 herds purchased feed management hardware, P project purchased software.
- 10 similar dairy herds in the incentive project served as “controls and did not use feed management programs.
- 8 of 10 “intensive” herds were located in Chesapeake Bay watershed.

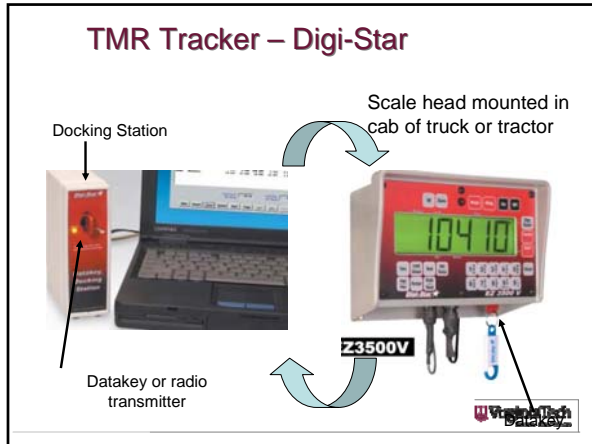


Feed management software
EZ Feed, Feed Watch, Feed Supervisor
TMR Tracker



Rations entered in computer program → Rations transferred to the mixer → Feeding information recorded at the scale → Information transferred to a computer program → Program generates reports using this information





Feed management inputs

- Inventory – amounts and cost of feeds
- Rations from nutritionist
- DM% of forages
- Pen counts – # animals receiving ration

Virginia Tech

Feed management outputs

- Feed utilization relative to inventory
- Loading accuracy by feeder
- Delivery accuracy
 - Fed weights vs called weights per pen.
- Ration cost per cow per day and per herd
- Income over feed cost (if milk weights entered)

Virginia Tech

Objective of intensive feed management study

- Determine impact of feed management programs on Whole Farm Nutrient Balance (WFNB) and feeding management on Virginia dairy farms.



Procedures

- Monthly– “Intensive” herds visited monthly by project staff. “Control” herd owners report bimonthly.
 - Daily milk yield / cow, fat%
 - Milking herd size
 - Sample each milking cow ration, forages, commodities used in ration.
 - Intensive herds unlimited ration, forage and commodities sampled each month
 - Control herds – three samples every two months



Procedures – cont’d.

- Annually calculate whole farm nutrient balance.
- Intensive herds - Compare ration amounts called to amount fed – compute feeding accuracy and precision.

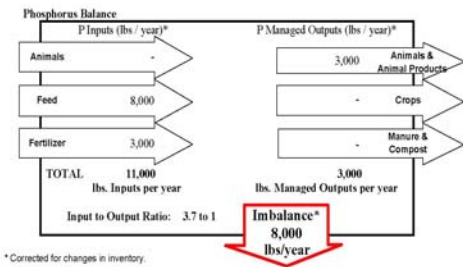


Compute "P" report

- Calculate amount of P fed to the herd
- Calculate P requirement for cows in the herd
- Express result as P consumed as percent of required.



Whole Farm Nutrient Balance



Farm information

- Intensive herds
 - One herd failed to successfully install software
 - One herd dispersed.
- Control herd participation varied by year
 - Year 1 – 8 herds
 - Year 2 – 4 herds
 - Year 3 is not completed for all control herds

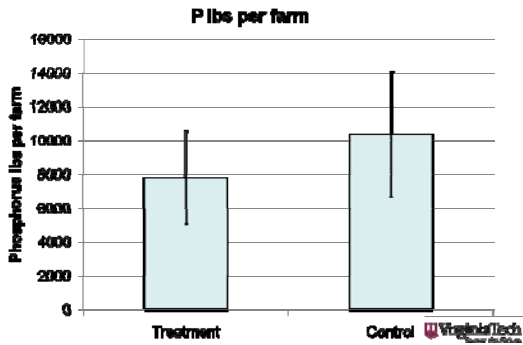


Farm Size

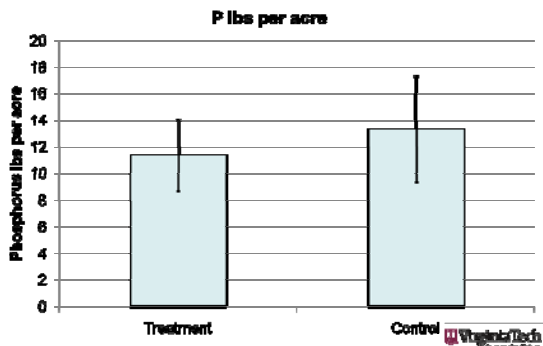
- Herd Size
 - Treatment: 290
 - Control: 325
- Milk Production
 - Treatment: 64.57lb/cow/d
 - Control: 57.42 lb/cow/d
- Farm size
 - Treatment: 805 acres
 - Control: 702 acres

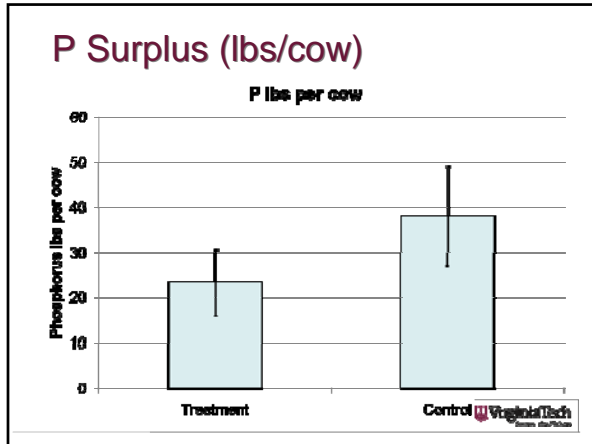


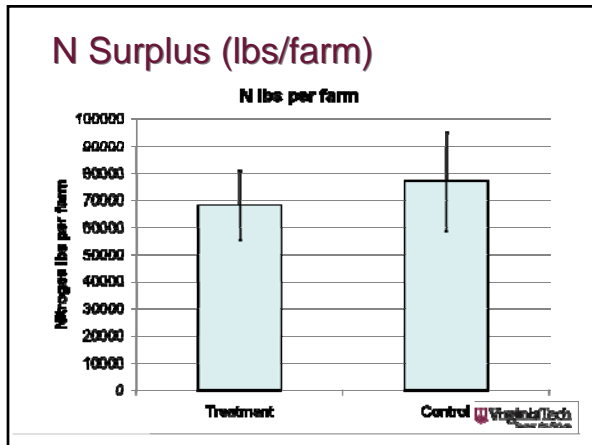
P Surplus (lbs/farm)

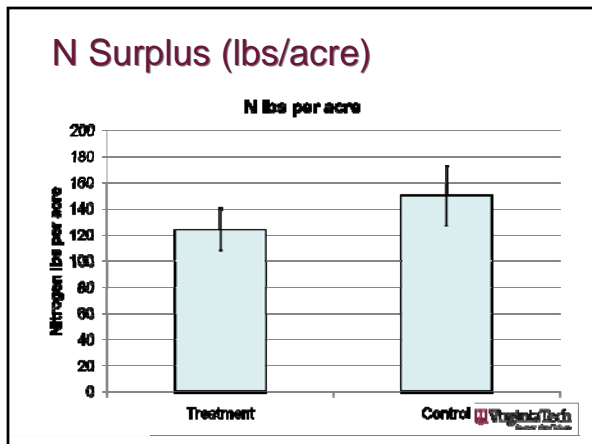


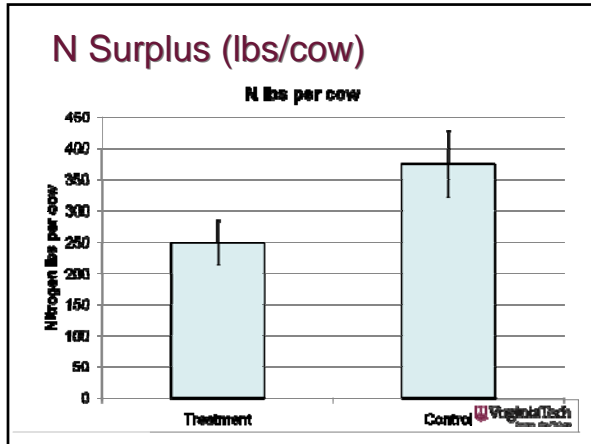
P Surplus (lbs/acre)












Phosphorus Surplus	Treatment Means ± Standard Error
Treatment, by farm	7818 ± 2768 lb
Control, by farm	10346 ± 3674 lb
Treatment, by acre*	11.3 +/- 3.4 lb.
Control, by acre*	14.9 +/- 5.23 lb.
Treatment, by cow	23.3 ± 7.5 lb
Control, by cow	38.1 ± 11.1 lb

Nitrogen Surplus	Treatment Means ± Standard Error
Treatment, by farm	68011 ± 12701 lb
Control, by farm	76787 ± 18231 lb
Treatment, by acre*	123 +/- 7.17 lb.
Control, by acre*	149 +/- 11.8 lb.
Treatment, by cow	248 ± 35 lb
Control, by cow	374 ± 53 lb




Accuracy of Phosphorus Feeding

Comparison of P fed vs. P requirements

Incentive payments based on (intake / req't)


- Within 16 – 25% - \$3/cow / year
- Within 15%, \$6/cow/year;
- Within 5%, \$12/cow/year

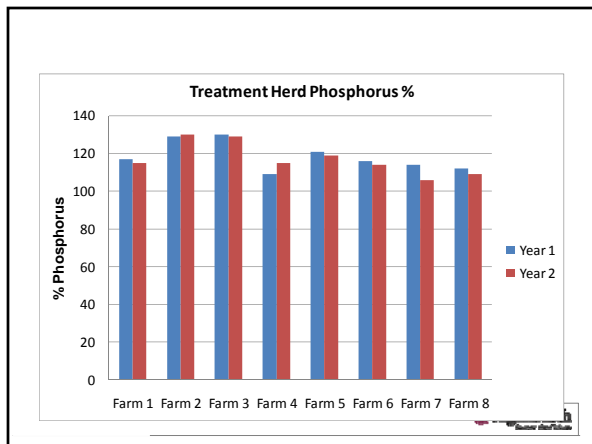
Payment capped at 400 cows

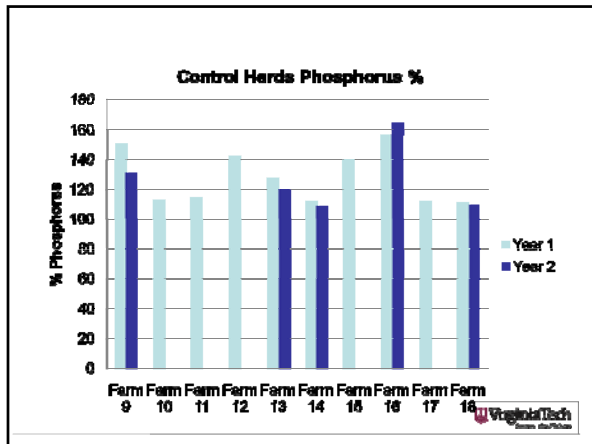


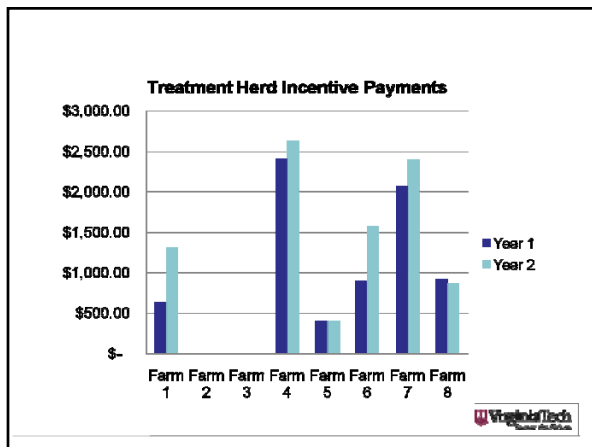
Incentive Payments Received

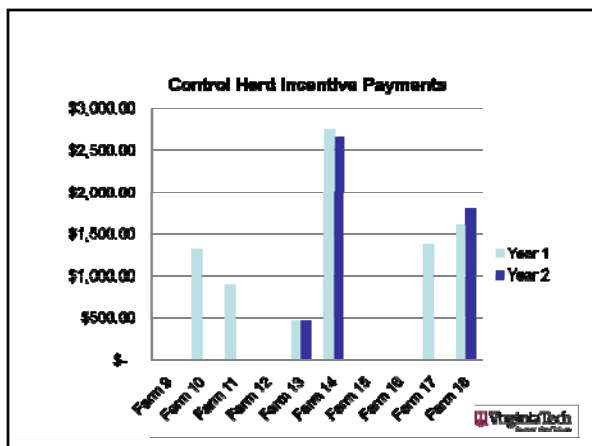
- Year 1:
 - 6 out of 8 treatment
 - 6 out of 10 control
- Year 2:
 - 6 out of 8 treatment
 - 3 out of 9 control









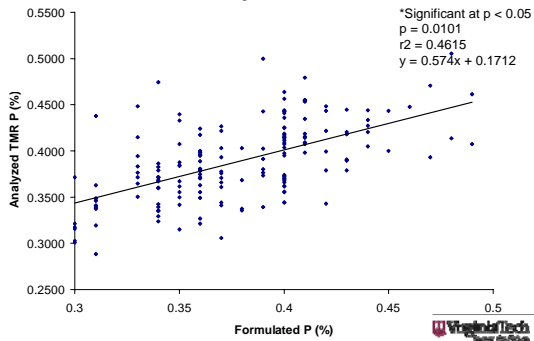


Lack of statistical significance

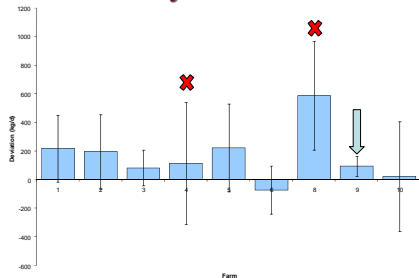
- Reasons
 - Utilization of software
 - Management
 - Economic changes
 - Cost of high P byproduct commodity feeds



Ration versus fed TMR P% year 1




Typical daily loading error – year 1




Feed management software provides:

- Tools to improve feed feeding management
 - Monitor feeders
 - Loading accuracy – ingredients
 - Loading time
 - Delivery accuracy when feeding multiple groups from the same load.



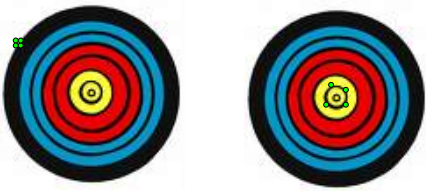
Feed management software

- Establish standard feeding protocol
 - Load order
 - Mix time
- Monitor equipment
 - Maintenance reminders
 - Check scale accuracy
- Monitor dry matter intake by group
 - Record refusals periodically
- Provide better communication with nutritionist – electronic reports to consultant.




Precision or accuracy?


Precise Accurate




Which is most desirable?



Sample of feeding information from intensive herds



Your Dairy Name
Your Address
Your City, State & Zip
Your Telephone No.
Your Fax No. & E-mail Address




From 02/01/09 to 02/28/09
Your Dairy: 2307000

Ingredient Deviation by Driver Report

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User ID: 1

Batch No.	Ingredient	Recipe	Date	Time	Ingredient			Cost			
					Call No.	Actual No.	Deviation	Error %	Planned	Actual	Error
4,001	BCS	KS2899	02/01/09	12:10 pm	98	82	166	+17.82	22.48	22.48	100.00
4,001	CSLTX	KS2899	02/01/09	12:14 pm	1187	1,200	170	+11.82	854.61	926.69	108.32
4,001	CSLTX	KS2899	02/01/09	12:14 pm	238	230	18	-7.54	412.80	412.08	100.42
4,001	CT290	KS2899	02/01/09	12:14 pm	380	370	10	-2.63	80.00	80.00	100.00
4,001	CSLTX	KS2899	02/01/09	12:14 pm	303	490	187	61.72	80.00	80.00	100.00
4,001	CSLTX	KS2899	02/01/09	12:11 pm	888	740	74	-8.33	888.70	814.37	91.63
4,001	HEGAL	KS2899	02/01/09	12:10 pm	97	107	10	10.31	848.59	847.00	99.81
4,001	MSL	KS2899	02/01/09	12:18 pm	280	300	20	7.14	80.00	80.00	100.00
4,001	MSL	KS2899	02/01/09	12:18 pm	1,438	1,490	244	16.98	80.00	80.00	100.00
4,001	MSL	KS2899	02/01/09	12:14 pm	979	1,460	481	49.14	824.89	824.90	100.00
4,001	CSLTX	KS2899	02/01/09	12:17 pm	1,808	1,100	708	-39.18	887.09	946.22	106.67







Implementing feed management

- Pennsylvania dairies are writing feeding management plans
- Feed management software provide the tools to achieve better accuracy and precision.
- Expenses of feed management software/hardware
 - Cost of entry level system is \$5,000+
 - Cost of top of the line system is \$25,000+
- Justifying the expense?
 - \$6.50 X 100 cows = \$650/day
 - Reduce overfeeding by 10% = \$65/day/100 cows



Acknowledgements

- NRCS 
- Virginia DCR 
- Digi-Star 
- Cooperator herds in Virginia



Graduate students



Beverly Cox



Brittany Stewart



Further Studies

- Two more years of data collection
- TMR Tracker data evaluated to study:
 - Loading deviation by ingredient
 - Achieving accurate rations?
 - Deviation in feed ingredient nutrient composition.
 - Daily nutrient intake deviation
- TMR Tracker survey
 - How do producers use the information?



Desirable Outcomes?

- Significant impact on WFNB?
 - Justify cost sharing to purchase feed management software/hardware if proven to reduce P overfeeding
- Determine reasons why some herds were unsuccessful in reducing overfeeding

