

DecisiveDry – Decision support for proper use of Selective Dry Cow Therapy while enhancing dairy sustainability

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To boost adoption of Selective Dry Cow Therapy (SDCT) among its dairy producer customers, Dairy Records Management Systems in the U.S. introduced a web-based software app that can be flexibly applied in herds that are good candidates for this management strategy. The decades-long use of Blanket Dry Cow Therapy (BDCT) has been effective to control mastitis levels in dairy herds but it contributes substantively to the level of antibiotic use and the risk for antibiotic resistant pathogens. DecisiveDry first helps by determining whether the herd is a good candidate for SDCT by assessing for the recent year: number of measurements of SCC, year average SCC and number of testdays that herd average SCC is greater than a level set by the user. Next DecisiveDry identifies which of the soon to turn-dry cows may be eligible for SDCT. Cow eligibility is assessed using SCC levels of the three most recent testdays plus the number of days since the most recent case of clinical mastitis. Of course, it is recommended that all cows receive teat sealant. The app provides various forms of lists of cows to turn dry and whether each cow is eligible for only teat sealant. Lastly, the app provides financial estimates of cost (treated cows) and savings (non-treated cows) of drugs and labor.

Abstract

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SDCT is not a new concept and is widely used in some European countries. However in the United States, SDCT has not gained as much traction and, on many dairy farms, dry cow therapies are applied to all cows at dry-off (BDCT). The common perspective is that BDCT minimizes mastitis problems with fresh cows and simplifies staff workflow. BDCT has been the gold standard to prevent intramammary infections (IMI) because it is most effective to methodically treat all quarters of every cow. Also, it is perceived that it is easiest for the milking staff to treat all quarters. However, it has been found that there is no difference in IMI subsequent to either BDCT or SDCT¹. Additionally, SDCT reduces antimicrobial use by 66%¹ which reduces cost plus is becoming increasingly important to consumers.

Introduction

The DecisiveDry app provides flexible yet methodical guidance to enable producers to deploy SDCT in their herd. DecisiveDry first assesses the herd's DHI herd average records to determine SDCT appropriateness and then it assesses DHI records for each potential dry cow. By closely following one of the three lists of potential dry cows, producers can be assured of consistent and proper application of the guidelines.

Is the herd a good candidate for SDCT?

By convention, application of SDCT has been targeted for herds with annual herd average SCC of 250,000 cell/mL or less and must have a minimum of 8 DHI testdays with SCC results. Of the 10,000 herds (2.0M cows) serviced by DRMS in 2023, 75% managed their herds to result in annual herd average SCC of less than 250,000 based on 8+ DHI testdays within the year.

Before including SDCT in a management scheme, a herd manager should also consider whether there has been an inordinate number of testdays with herd average SCC greater than 250,000. So – were there any spikes of herd average SCC?

For the 75% of DRMS herds with herd year average SCC less than 250,000 and a minimum of 8 SCC testdays, Table 1 displays percent of testdays with testday herd average SCC spikes (> 250,000). The shaded area in Table 1 portrays percent of herds with high numbers (3 or more) of testday SCC spikes. Clearly, the small herds produced a greater percentage of testday SCC spikes (25% for herds with less than 100 cows) than the larger herds (8% for herds with 1000+ cows). However overall, 80% (of the previous 75%...) of herds would qualify for SDCT.

Is the cow a good candidate for SDCT?

Typically within herds that qualify for SDCT, managers will screen cows to turn dry using multiple metrics to optimize potential for success with SDCT and minimize chances of mastitis in the subsequent lactation. Usual screening is for less than 150,000-200,000 cell/ mL on the last testday and an average SCC on the last three testdays of less than 200,000. Additionally, a cow may be excluded because of a case of clinical mastitis within 90 to 100 days.

Table 1. Percent of DRMS Herds by Herd Size with Year Average SCC < 250,000 with Number of Testdays that Averaged High SCC (\geq 250,000 cell/mL).

# Cows	Herd		
	Size		
	0	1 - 2	3+
< 100	39	36	25
100-299	56	27	16
300-999	72	18	10
1000+	79	13	8
All	49	31	20

Table 2. Percent of DRMS Cows that Qualify for SDCT by Herd Size in Qualifying Herds.

Size # Cows	Herd	
	Percent of Herds	Percent of Cows Qualified for SDCT
< 100	52	76
100-299	29	80
300-999	13	82
1000+	6	83
All		79

After filtering for the herds identified in Table 1 with fewer than 3 testday average SCC spikes (80% of the herds with 8 testdays in 2023), the table below depicts the percentage of cows that would qualify for SDCT because SCC on the final testday prior to dry-off was less than 200,000 and the average SCC for the final three testdays was less than 200,000. Seventy-nine percent of cows qualified - and there was little difference in percents of qualifying cows by herd size.

In its outreach campaigns for DecisiveDry, DRMS primarily targets producers that use its proprietary on-farm Dart herd management software and producers that take advantage of DartSync. DartSync is co-hosted software residing both on-farm and on DRMS servers. This software backs up the on-farm database while also synchronizing with data tables at DRMS. Although most producers send data from on-farm only once per day, there is the flexibility to synchronize multiple times daily. This synchronization facilitates the readiness of the DecisiveDry app for proper management of eligibility for SDCT. Approximately 45% of the cows that are serviced by DRMS are targeted by these systems.

Targeted producers

The HerdHQ suite of apps provide an array of services for DRMS clients including producers and industry members such as herd consultants. Like all of the apps in the HerdHQ suite, although DecisiveDry will function appropriately using data and information from herds that do not use Dart or DartSync, it operates most effectively for participating herds.

DecisiveDry is a component of HerdHQ suite of apps

As depicted in Figure 1, the producer will complete entries to enable DecisiveDry to assess herd records and make recommendations. The interpretation of most fields are apparent but some additional explanations a *String # of cows to include*: enables the producer to subset cows by lot. Many herds set=0 to include all lots.

Getting started: herd and cow setup

- **Data Source:** although a Dart producer will most likely choose DartSync, other producers will choose to access dry-off advice immediately after testday.
- **Names of Mastitis Events in Dart:** because of flexibility in Dart for naming health events, the producer will identify the names associated with cases of clinical mastitis events in his herd.
- **Cows to Dry in Next X Days:** enables customization to fit various management schemes for frequency of dry-off.
- **Drug and Labor costs:** per cow estimates will facilitate computation of financial impacts.

Report Name Cows to Dry Off

HerdCode 42559999

String # of cows to include (0=all cows) 0

Data Source DartSync

Names of Mastitis Events in Dart MAST 2+ QRTS ✕ MAST LFT FRT ✕ MAST LT REAR ✕
MAST RGT FRT ✕ MAST RT REAR ✕

For SDCT, Don't Include Cows With Mastitis Event Within ? Days 100

Don't Recommend SDCT in Herd if Avg SCC > ? 250

For SDCT, Don't Include Cows With SCC > ? 200

Target # of Days Dry 60

Cows to dry in next X days 14

Drug cost per cow 12.00

Labor cost per cow 3.00

Figure 1. Input parameter screen for DecisiveDry.

DecisiveDry output

As illustrated in Figure 2, assessment results of the herd's eligibility for SDCT are portrayed in either green (OK to use SDCT for cows) or red (BDCT recommended) using the above criteria. Additionally, the herd assessment provides counts of the numbers of cows in the dry-off cohort to suggest for treatment and no-treatment. Plus, the producer's own estimates of per cow costs are used to predict the cost of treatment and the savings for no-treatment of the dry-off cohort.

DecisiveDry Results as of 4/11/2024

Report Name: **Cows to Dry Off**
HerdCode: **42559999**
Data source: **DartSync**
String: **0**

Past 12 Months SCC Tests: **11** ✓
Past 12 Months High SCC Tests: **0** ✓
Avg SCC Herd: **173** ✓
Herd's Max SCC for SDCT Eligibility: **250**
Cow's Max SCC for SDCT Eligibility: **200**
Cow's Min Days Since Mastitis: **100**

Target Period: **60 (days)**
Cows Suggested for Therapy: **1** ⚠
Cows Suggested for No Therapy: **7** ✓
Cost of drugs & labor for treated cows: **\$15.00**
Savings in cost of drugs & labor for non treated cows: **\$105.00**

Results **Detailed Results** **Export Results**

Cow	Name	Grp#	Lact#	DIM	Prev Milk	Curr Milk	Prev TD SCC	Curr TD SCC	Days Sinc Last Mast	Last 3TD SCC	SDCT elig	Dry	Due
444	444	2	4	261	92.4	75.5	13	27		17	Y	05/19	07/18
512	512	2	3	423	61.2	54.8	81	76		71	Y	05/19	07/18
599	599	2	3	257	107.1	103.7	19	31		28	Y	05/19	07/18
844	844	2	1	392	94.8	101.6	50	23		37	Y	05/19	07/18
918	918	2	1	253	69.8	65.5	44	71		51	Y	05/26	07/25
711	711	2	2	341	49.6	32.8	141	123		114	Y	05/26	07/25
763	763	2	2	290	79.0	86.8	857	325		817	N	05/26	07/25
591	591	2	3	253	75.9	85.2	50	31		25	Y	05/26	07/25

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Figure 2. Output screen for DecisiveDry.

- The lower portion of the output screen lists the dry-off cohort of cows in index order with these additional features: Eligible cows are shaded in green.
- Not-eligible cows are shaded in pink and include highlight symbols.
- Columns are sortable.
- CowID may be clicked to gain access to other information.
- Wide and narrow versions are available.

As illustrated in Figure 3, when the producer uses a phone with the narrow version of output or sends the CSV file to a phone, all necessary information will be available cowside for proper management.

In summary, as U.S. dairy farmers continue to move towards using less antibiotics while also focusing on maintaining and improving overall herd health, DecisiveDry is an easy-to-use decision support tool. It is customizable to the individual farm situation, will speed up the process of sorting through information for many cows, and it can help minimize inappropriate or unnecessary antibiotic use. DecisiveDry can lead to greater profitability while supporting overall sustainability of the dairy farm.

Cowside management

Kabera F., J.-P. Roy, M. Afifi, S. Godden, H. Stryhn, J. Sanchez, and S. Dufour. 2021. Comparing Blanket vs. Selective Dry Cow Treatment Approaches for Elimination and Prevention of Intramammary Infections During the Dry Period: A Systematic Review and Meta-Analysis. *Front. Vet. Sci.*, 15 June 2021. v. 8.

List of references

Cow	Name	Grp#	Lact#	DIM	PrevMilk	CurrMilk	PrevTD	CurrTD	DaysSinc	Last3TD	SCC	SDCT	Elig	Dry	Due
580	580	2	3	265	63.2	41.7	174	141			123	Y		05/11	07/10
611	611	2	3	265	95.1	90.7	57	57			53	Y		05/12	07/11
732	732	2	2	301	57.4	47.7	132	152			90	Y		05/12	07/11
877	877	2	1	334	94.2	91	13	13			13	Y		05/12	07/11
5165	5165	2	6	269	95.2	92.1	13	23			16	Y		05/12	07/11
872	872	2	1	323	65.6	63.7	230	400			352	N		05/16	07/15
705	705	2	2	458	48.8	39.5	66	123			87	Y		05/16	07/15
844	844	2	1	392	94.8	101.6	50	23			37	Y		05/19	07/18
599	599	2	3	257	107.1	103.7	19	31			28	Y		05/19	07/18
444	444	2	4	261	92.4	75.5	13	27			17	Y		05/19	07/18
512	512	2	3	423	61.2	54.8	81	76			71	Y		05/19	07/18

Figure 3. Excel file from DecisiveDry portrayed on phone.