Supplementary Table S1. Complete list of variables included in both the BRD1 and BRD2 datasets.

Variable Category	Variable	Description
Cohort level	Arrival weight of the cohort	Average weight of the cohort on arrival
	Year of arrival	Year the cohort arrived
	Quarter of arrival	Quarter of the year that the cohort arrived (1 = Jan. – Mar., 2 = Apr. – Jun., 3 = July – Sept., 4 = Oct. – Dec.)
	Month of arrival	Month of the year that the cohort arrived
	Day of arrival	Day of the week that the cohort arrived (1 = Mon., 2 = Tues., 3 = Wed., 4 = Thurs., 5 = Fri., 6 = Sat., 7 = Sun.)
	Arrived on a _____	Binary variables (1 = yes, 0 = no) for each day of the week a cohort could have arrived
	Arrived on a holiday	Binary variable (1 = yes, 0 = no) for whether or not a cohort arrived on a holiday; includes all federal holidays
	Sex	The sex of the cohort; could be steer, heifer, or mixed
	Month of max fill	Month of the year that the pen reached capacity (would be the same as date of arrival if the pen was filled on that day)
	Day of max fill	Day of the week that the pen reached capacity (1 = Mon., 2 = Tues., 3 = Wed., 4 = Thurs., 5 = Fri., 6 = Sat., 7 = Sun.)
	DOF of max fill	Days on feed that the lot took to reach capacity (date of arrival – date of max fill)
	Total head in	Number of head in the cohort on day of arrival

	Number of treatments on the same day	Count of additional treatments for any reason in that cohort on a specific event date
	Number of treatments last week	Count of treatments for any reason in that cohort in the last 7 days before the event date
	Number of treatments to date	Count of treatments for any reason in that cohort since it arrived on the feedyard
	Distance between origin and feedyard	Calculated distance in kilometers between a cohort's origin and the feedyard at which they are being fed
	Total deads in cohort	Cumulative count of mortalities for any reason in a cohort up to the event date
	Total rails in cohort	Cumulative count of animals culled (railed) for any reason in a cohort up to the event date
	Origin latitude	Latitude in degrees of the cohort's origin
	Origin longitude	Longitude in degrees of the cohort's origin
Individual animal level	Year of BRD1	Year the animal received its first treatment for BRD
	Quarter of BRD1	Quarter of the year that the animal received its first treatment for BRD (1 = Jan. – Mar., 2 = Apr. – Jun, 3 = July. – Sept., 4 = Oct. – Dec.)
	Month of BRD1	Month of the year that the animal received its first treatment for BRD
	Day of BRD1	Day of the week that the animal received its first treatment for BRD (1 = Mon., 2 = Tues., 3 = Wed., 4 = Thurs., 5 = Fri., 6 = Sat., 7 = Sun.)
	Treated for BRD1 on a _____	Binary variables (1 = yes, 0 = no) for each day of the

		week an animal could have received its first treatment for BRD
	Treated for BRD1 on a holiday	Binary variable (1 = yes, 0 = no) for whether or not an animal received its first treatment for BRD on a holiday; includes all federal holidays
	Event DOF	Days spent on feed until first treatment for BRD (date of arrival – event date)
	Temperature	Rectal temperature obtained at first treatment for BRD
	Event weight	Weight at first treatment for BRD
	Treated for GI previously	Binary variable (1 = yes, 0 = no) for whether or not an animal was treated for digestive issues prior to the first treatment for BRD
	Treated for MS previously	Binary variable (1 = yes, 0 = no) for whether or not an animal was treated for musculoskeletal issues prior to the first treatment for BRD
	Treated for repro previously	Binary variable (1 = yes, 0 = no) for whether or not an animal was treated for reproductive issues prior to the first treatment for BRD
	Treated for other previously	Binary variable (1 = yes, 0 = no) for whether or not an animal was treated for any other issue prior to the first treatment for BRD
	ADG at BRD1	Calculated average daily gain at event date ((event weight – arrival weight)/event DOF)
Feedyard level	Number of treatments on the same day at feedyard	Count of additional treatments at the yard on the same event date
	Number of treatments last week at feedyard	Cumulative count of all treatments at the yard in the

		last 7 days prior to the event date
	Moving averages of treatments	Moving averages of the number of treatments at the feedyard in 3-, 5-, 7-, 14-, 21-, and 28-day increments prior to day of first treatment for BRD
	Divergence from moving average	The difference in the event date's number of treatments from each of the increments of moving averages of treatments at the feedyard

BRD1 indicates the first treatment for BRD.