Measuring Range Livestock Productivity

University of California
Agriculture and Natural Resources

By Sheila Barry, Livestock and Natural Resource Advisor
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Livestock production is a function of genetics, nutrition and management.

Genetics: For livestock grazing rangelands, genetic improvement is dependent primarily upon sire selection. Males contribute approximately 90% of the gene pool for a cowherd because one male breeds multiple cows. For example, in one season a bull breeding 25 cows can contribute more to the genetic make-up of a herd than a cow contributes in her lifetime. Important traits influencing productivity include: fertility, maternal ability, growth rate, feed efficiency, carcass merit, conformation, and longevity.

Nutrition: Nutritional status of rangeland livestock is determined by class of animal and forage quality and quantity, which in turn is influenced by the weather, ecological site and grazing management. For example, protein, energy, phosphorus and Vitamin A are typically inadequate to support a growing animal grazing on California's annual rangelands through the summer and early fall. Nutritional deficiencies in forage can be overcome with proper supplementation, which may include mineral, energy and protein supplementation depending on the site, season, and class of livestock. Water quality and quantity can also impact nutritional status.

Management: Management of rangeland livestock influences genetics and nutritional status; however, it also can impact reproduction, morbidity, and mortality. For example, a herd health program can minimize the incidents of disease and impacts to animal performance from pests and parasites.

Range Livestock Production.
The two most common types of cattle operations on California's rangelands are Cow-Calf and Stocker.

Type of Operation	**Production Goal**	**Common Measures of Production**
Cow-Calf Cows bred on the range to bulls to produce a new calf each year	Every cow weans one calf each year. Maximize weaning weights with minimal inputs.	-Calf crop % (number of calves weaned per cows bred) -Weaning weights (steers vs heifers)
Stocker Cattle (often yearlings) grazed to grow and gain weight	Maximize weight gain per animal	-Average Daily Gain (ADG) -Total gain per season

Weight gained per acre

If rangeland or pasture use can be maximized than measuring lbs gained per acre may also be useful; however, maximizing lbs of gain per acre may result in lower individual animal performance. Also ranchers are often optimizing rangeland use rather than maximizing it because of other site goals and objectives including risk management (leaving feed to come back to in the fall), habitat management, and invasive species management.

Production Data Examples

COW/CALF OPERATIONS:

Operation #1 - Cow/Calf Pairs in Central Alameda County (Private Property w/ predator control)
Approximately 930 acres - Fairly steep terrain with good forage productivity
** Fall Calving (Cows pregnancy checked so we are starting with 100% pregnancy rate)

YEAR	14/15	15/16	16/17	17/18
# of Cows	76	78	94	90
Date 1st Calf Born	8/12/2014	8/6/2015	8/9/2016	7/28/2017
# Calves @ Branding	70	72	89	86
# Calves Weaned	68	72	88	85
Weaning Date	5/28/2015	6/3/2016	6/13/2017	6/19/2018
Avg. Steer Weight	688 lbs.	692 lbs.	712 lbs.	723 lbs.
Avg. Heifer Weight	645 lbs.	652 lbs.	678 lbs.	682 lbs.
Avg. Age @Weaning	248 days	260 days	267 days	285 days
Weaned Calf Crop %	89.4%	92.3%	93.6%	94.4%
Lbs. per Acre	48.7 lbs	52.0 lbs	65.8 lbs	64.2 lbs

Operation #2 - Cow/Calf Pairs in northern Santa Clara County (Public land w/ no predator control)
Approximately 1,270 acres - Very steep terrain with fair forage productivity
** Fall Calving (Cows pregnancy checked so we are starting with 100% pregnancy rate)

YEAR	14/15	15/16	16/17	17/18
# of Cows	No Data	72	96	93
Date 1st Calf Born	No Data	8/14/2015	8/8/2016	8/2/2017
# Calves @ Branding	No Data	62	80	84
# Calves Weaned	No Data	60	79	79
Weaning Date	No Data	6/4/2016	6/14/2017	6/18/2018
Avg. Steer Weight	No Data	672 lbs.	674 lbs.	676 lbs.
Avg. Heifer Weight	No Data	642 lbs.	638 lbs.	644 lbs.
Avg. Age @Weaning	No Data	252 days	266 days	276 days
Weaned Calf Crop %	No Data	83.3%	82.2%	84.9%
Lbs. per Acre		31 lbs	40.8 lbs	41.1 lbs

STOCKER OPERATIONS:

Operation #1 - Steers in Western Alameda County

Approximately 1,235 acres - Relatively steep terrain but high forage productivity

** Typically grazed lightly as cow/calf pairs graze same pastures later in the season

YEAR	14/15	15/16	16/17	17/18
# of Head In	286	328	411	356
In Date	11/26/2014	12/3/2015	11/28/2016	12/13/2017
Avg. In Weight	572 lbs.	565 lbs.	584 lbs.	554 lbs.
Avg. Out Weight	884 lbs.	866 lbs.	1,011 lbs.	880 lbs.
Out Date	6/25/2015	6/9/2016	6/21/2017	6/19/2018
# of Head Out	282	322	405	348
Days on Grass	212	193	210	197
Avg. Daily Gain(ADG)	1.47	1.56	2.03	1.65
Avg. Total Gain/Hd	312 lbs.	301 lbs.	427 lbs.	326 lbs.
Death Loss	1.40%	1.83%	1.46%	2.25%
Lbs. per acre	72.3 lbs	80.0 lbs	142 lbs	94.0 lbs

Operation #2 - Steers in Central Alameda County

Approximately 1,045 acres - Gentle terrain with high forage productivity

YEAR	14/15	15/16	16/17	17/18
# of Head In	302	288	348	322
In Date	12/5/2014	11/26/2015	12/4/2016	11/26/2017
Avg. In Weight	512 lbs.	488 lbs.	502 lbs.	522 lbs.
Avg. Out Weight	814 lbs.	801 lbs.	914 lbs.	846 lbs.
Out Date	6/6/2015	5/29/2016	6/9/2017	6/5/2018
# of Head Out	297	286	342	313
Days on Grass	190	192	194	198
Avg. Daily Gain(ADG)	1.59	1.63	2.12	1.63
Avg. Total Gain/Hd	302 lbs.	313 lbs.	412 lbs.	324 lbs.
Death Loss	1.66%	1.39%	1.72%	2.80%
Lbs. per acr	87.3 lbs	86.3 lbs	137 lbs	99.8 lbs

Operation #3- Steers in Monterey County
Approximately 45,000 acres Varied sources 12/13

YEAR	12/13	12/13	12/13	Total
Source of Stockers	**Bridgeport**	**Yolo**	**Mexico**	
# of head in	2439	208	461	3108
In Date	Aug-Nov	Dec	Dec	
Avg. In Weight	575 lbs	698 lbs	420 lbs	560 lbs
Avg. Out Weight	864 lbs	1000 lbs	522 lbs	823 lbs
Out Date	April-July	May-June	March-May	
# of Head Out	2431	208	459	3098
Days on Grass	207 days	153 days	99 days	187 days
Avg. Daily Gain (ADG)	1.4	1.97	1.03	1.4
Avg. Total Gain/Hd	289	302	102	
Death Loss	0.33%	0%	0.43%	0.32%

Operation #3 - Steers in Monterey County
Approximately 45,000 acres

YEAR	12/13	13/14	15/16	16/17
# of Head In	3108	709	4032	4812
In Date	Aug-Dec	Oct-Nov	Sept-Mar	Oct-Mar
Avg. In Weight	560 lbs.	627 lbs.	589 lbs.	593 lbs.
Avg. Out Weight	823 lbs.	744 lbs.	837 lbs.	914 lbs.
Out Date	March-July	Feb-June	June-July	May-July
# of Head Out	3098	708	4015	4779
Days on Grass	187 days	173 days	171 days	212 days
Avg. Daily Gain (ADG)	1.4 lbs	0.67	1.45	1.52
Avg. Total Gain/Hd	262 lbs	117	248 lbs.	322 lbs.
Death Loss	0.32%	0.14%	0.42%	0.69%
Lbs per acre	18.1 lbs	1.8 lbs	22.2 lbs	34.4 lbs