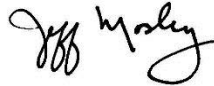


MEMORANDUM

TO: Bonnie Hamilton
Montana Department of Revenue

FROM: Jeff Mosley
Professor of Range Science & Extension Range Management Specialist



DATE: June 1, 2020

SUBJECT: Agricultural Property Tax Classification

**Department
of
Animal
and
Range
Sciences**

Per your request, I have estimated the number of Animal Unit Months (AUMs) necessary to generate \$1500 in annual gross income. My calculations used the spreadsheet originally developed by Dr. Myles Watts from the Department of Agricultural Economics and Economics at Montana State University. Dr. Watts prepared the original spreadsheet for the Montana Department of Revenue in July 2009. At your request in 2014, I reviewed the spreadsheet for accuracy, updated it with recent cattle prices, and then used the spreadsheet to estimate the number of AUMs needed to meet the \$1500 revenue threshold. I used the same spreadsheet again this year after updating it with cattle prices from 2013–2019.

I obtained cattle price data from the USDA Agricultural Marketing Service and the Livestock Marketing Information Center. From 2013–2019 in Montana, the Olympic average for calves was \$172.95 and the Olympic average for slaughter cows was \$73.55 (Table 1).

Table 1.

Year	Calf Price (cwt)	Cow Price (cwt)
2019	\$167.27	\$61.95
2018	\$162.46	\$61.97
2017	\$161.23	\$65.32
2016	\$146.33	\$69.15
2015	\$207.90	\$96.71
2014	\$250.35	\$103.71
2013	\$165.91	\$74.59
Olympic Average	\$172.95	\$73.55

Extension Range Management
213 Animal Bioscience Bldg
PO Box 172900
Bozeman, MT 59717-2900

Tel (406) 994-5601
Fax (406) 994-5589
Email jmosley@montana.edu

The Montana State University Extension Service is an ADA/EO/AA/Veteran's preference employer and educational outreach provider.

Spreadsheet results are shown below in Table 2 for 6 alternative management scenarios with 1200-lb cows:

- Alternative 1: raise own replacements and account for calf forage consumption
- Alternative 2: raise own replacements but do not account for calf forage consumption
- Alternative 3: purchase replacements and account for calf forage consumption
- Alternative 4: purchase replacements but do not account for calf forage consumption
- Alternative 5: purchase bred cows (no bulls or replacements) and account for calf forage consumption
- Alternative 6: purchase bred cows (no bulls or replacements) but do not account for calf forage consumption

The Olympic average from the 6 alternatives in Table 2 is 23.46 AUMs. Alternatives 3 and 4 are most typical of small beef cattle operations, and the average for Alternatives 3 and 4 is 23.18 AUMs.

Recommendation: In the 2021 reappraisal cycle, the Montana Department of Revenue should consider using 23 AUMs as the minimum number of AUMs necessary to generate \$1500 of annual gross income.

Table 2.

Herd Composition, Weight, and Prices	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Cows	1	1	1	1	1	1
Bulls (1 bull per 25 cows)	0.04	0.04	0.04	0.04	0	0
Replacement Heifers (18% replacement rate)	0.18	0.18	0.18	0.18	0	0
Calves Weaned (91% weaning percentage)	0.91	0.91	0.91	0.91	0.91	0.91
Cow Weight (1200 lbs)	1200	1200	1200	1200	1200	1200
Calf Weight (45% of cow weight)	540	540	540	540	540	540
Olympic Average Cow Price (2007-2013)	73.55	73.55	73.55	73.55	73.55	73.55
Olympic Average Calf Price (2007-2013)	172.95	172.95	172.95	172.95	172.95	172.
Calves Sold (calves weaned - replacements)	0.73	0.73	0.91	0.91	0.91	0.91
Cow Death Loss (1%)	0.01	0.01	0.01	0.01	0.01	0.01
Cows Sold (replacements - cows died)	0.17	0.17	0.17	0.17	0.17	0.17
Animal Unit Months (AUMs)						
Animal Unit Equivalent - Cows	1.2	1.2	1.2	1.2	1.2	1.2
Animal Unit Equivalent - Bulls	1.5	1.5	1.5	1.5	0	0
Animal Unit Equivalent - Replacement Heifers	0.85	0.85	0.85	0.85	0	0
Animal Unit Equivalent - Calves	0.3	0	0.3	0	0.3	0
Cow AUM (cow AUE x 1.0)	1.2	1.2	1.2	1.2	1.2	1.2
Bull AUM (bull AUE x 0.04)	0.06	0.06	0.06	0.06	0	0
Replacement Heifer AUM (replacement heifer AUE x 0.18)	0.15	0.15	0.15	0.15	0	0
Calf AUM (calf AUE x 0.91)	0.27	0	0.27	0	0.27	0
Grazing Months	10	10	10	10	10	10
Total AUMs (sum of cow, bull, heifers, and calf AUMS)	16.8	14.1	16.8	14.1	14.7	12
Revenue						
Calf Revenue (calf weight x calf price x calves sold/100)	681.77	681.77	849.88	849.88	849.88	849.88
Cow Revenue (cow weight x cow price x cows sold/100)	150.04	150.04	150.04	150.04	150.04	150.04
Total Revenue per Cow (calf revenue + cow revenue)	831.81	831.81	999.92	999.92	999.92	999.92
Revenue per AUM (total revenue per cow / total AUMs)	49.51	58.99	59.52	70.92	68.02	83.33
Minimum Revenue Threshold	1500	1500	1500	1500	1500	1500
AUMS Needed (Minimum Revenue/Revenue per AUM)	30.30	25.43	25.20	21.15	22.05	18.00