Exploratory Data Analysis and Data Visualization

July 1, 2019

Beef Calf Lots

94,872 lots

Descriptive Statistics

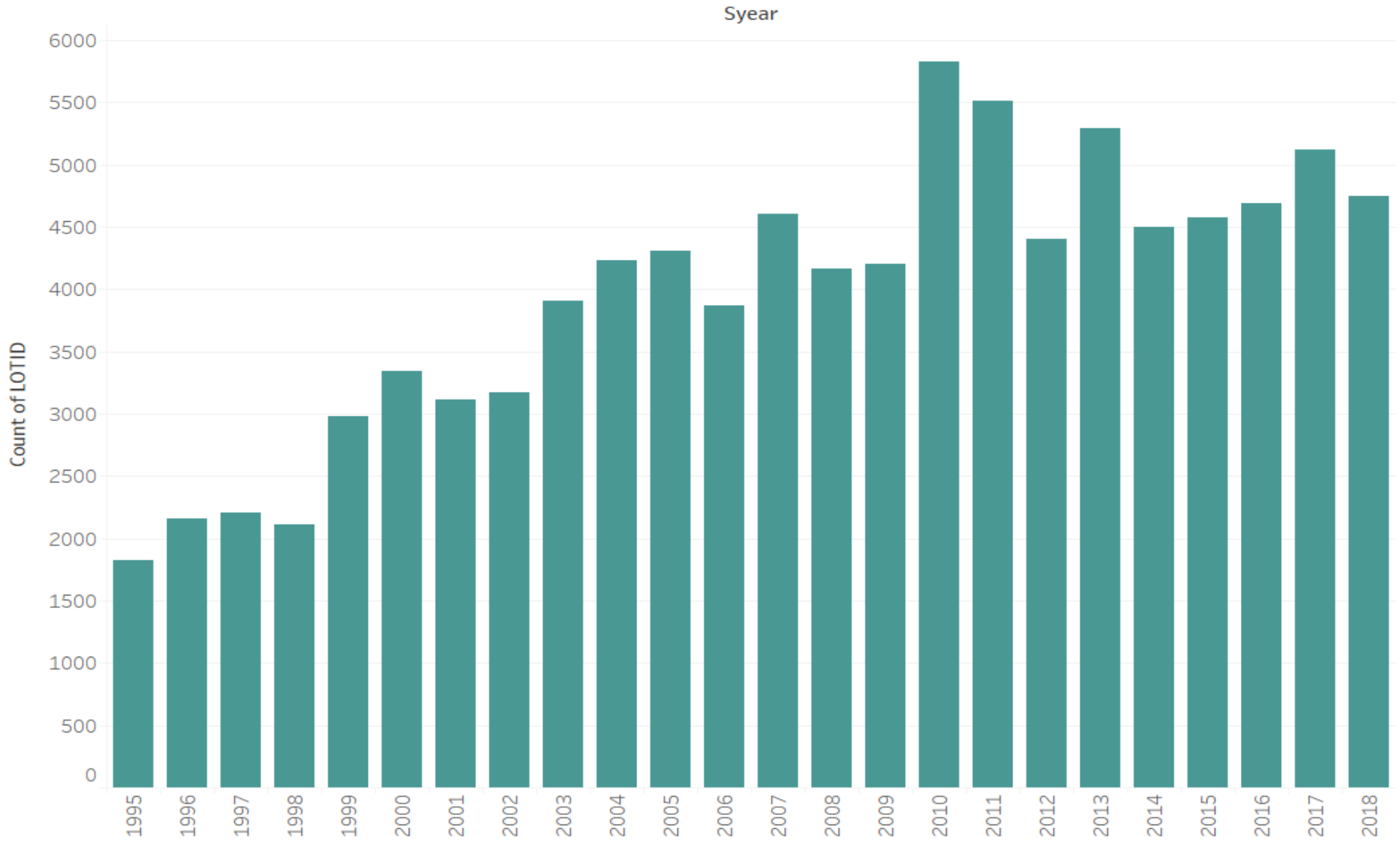
Factor	Mean	SD	Range
Size of lot (head)	111.5	72.0	5 to 1,380
Weight	561.0	79.0	235 to 960
Sale Price ($/cwt)	134.75	48.86	41.25 to 422.00

111.5 * 561 = 62,551.5

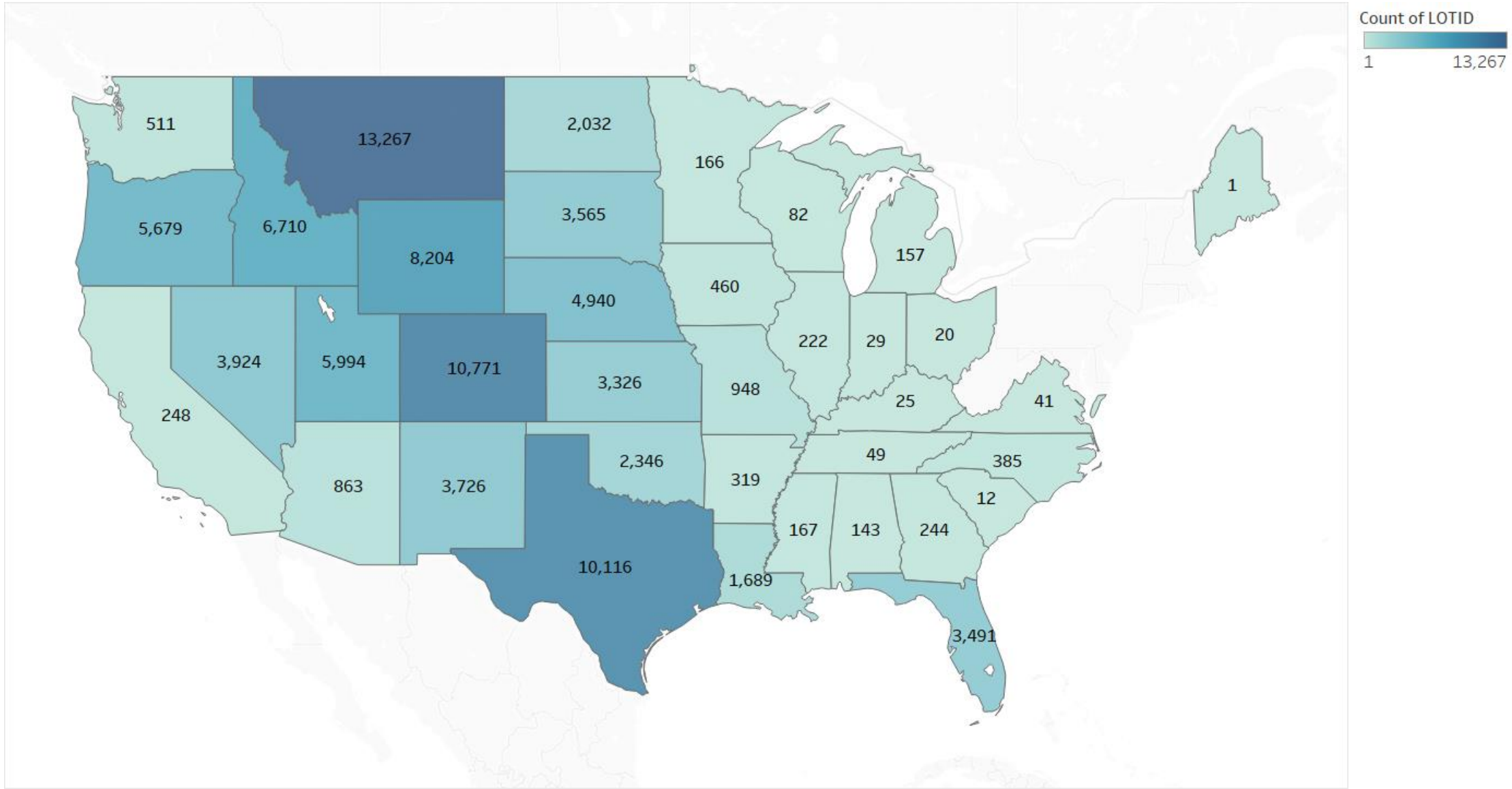
	SYEAR	LOTID	SMONTH	HEAD	SEX	WT	PRICE	STATECODE	SAREA	BREED	FRAME	FLESH	VAC
SYEAR	1.000000												
LOTID	0.971616	1.000000											
SMONTH	-0.088036	-0.047674	1.000000										
HEAD	-0.112701	-0.107917	-0.016740	1.000000									
SEX	-0.003453	-0.002026	-0.001158	-0.083927	1.000000								
WT	0.125283	0.116331	-0.085901	-0.133153	-0.233292	1.000000							
PRICE	0.732215	0.723935	-0.083700	-0.029359	-0.089740	-0.053411	1.000000						
STATECODE	-0.167889	-0.184238	0.006256	-0.006816	0.010311	-0.037952	-0.123237	1.000000					
SAREA	-0.041601	-0.040155	-0.000927	-0.040767	0.015743	-0.024189	-0.075940	0.880773	1.000000				
BREED	-0.185266	-0.166417	0.042095	-0.046834	0.044483	-0.040775	-0.177306	0.362120	0.407920	1.000000			
FRAME	-0.001793	0.007888	0.032692	-0.008735	-0.012067	0.216679	-0.017083	-0.138771	-0.161950	0.029630	1.000000		
FLESH	-0.036868	-0.038818	-0.014937	-0.096600	-0.015052	0.226646	-0.073875	0.012126	0.010374	-0.023344	0.032364	1.000000	
VAC	0.432266	0.368652	-0.103688	-0.037788	-0.012702	0.091223	0.306816	-0.133954	-0.106852	-0.184929	-0.008353	0.040442	1.000000

Correlations

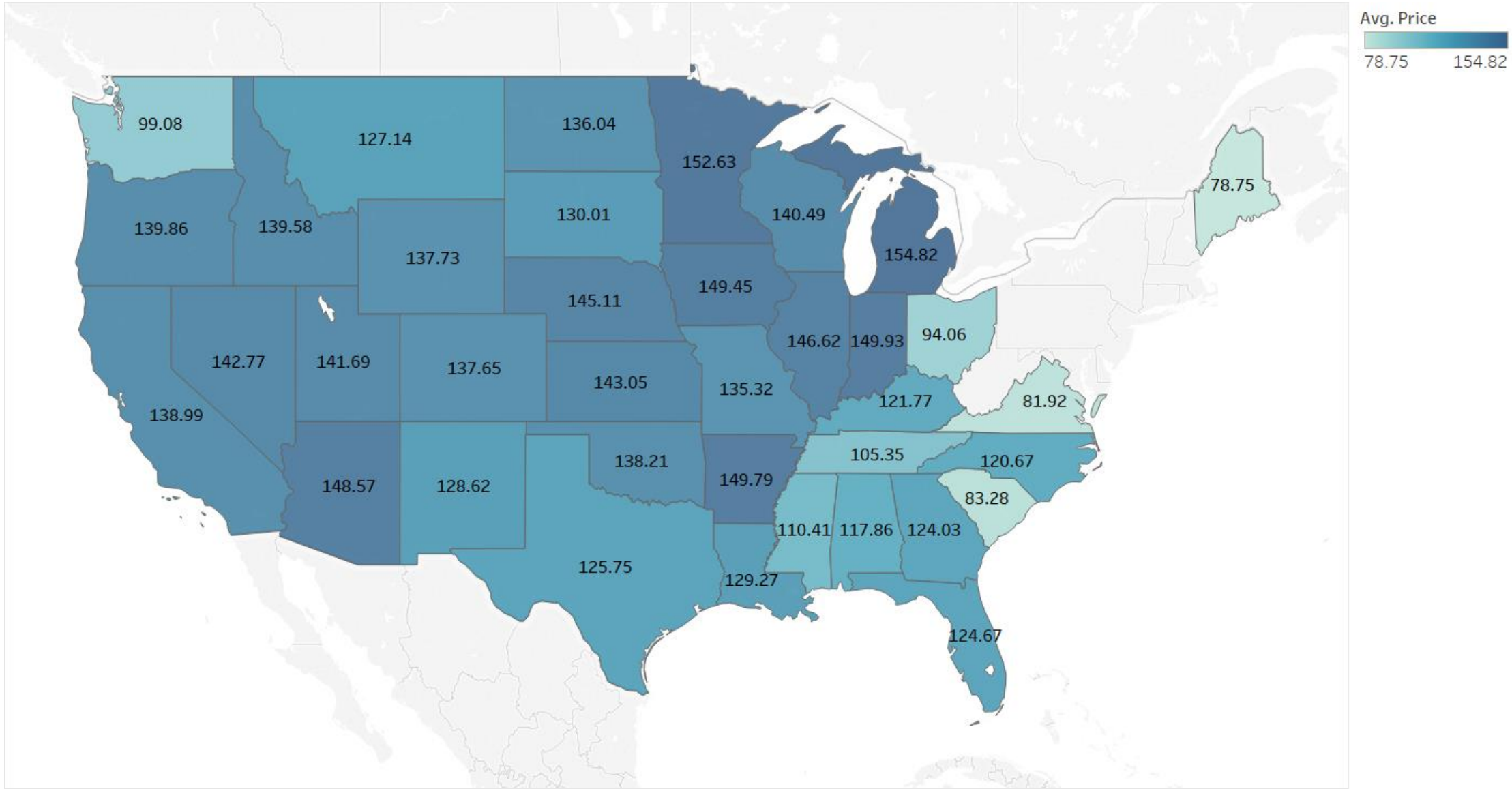
Sale Year


Syear
Count of LOTID
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

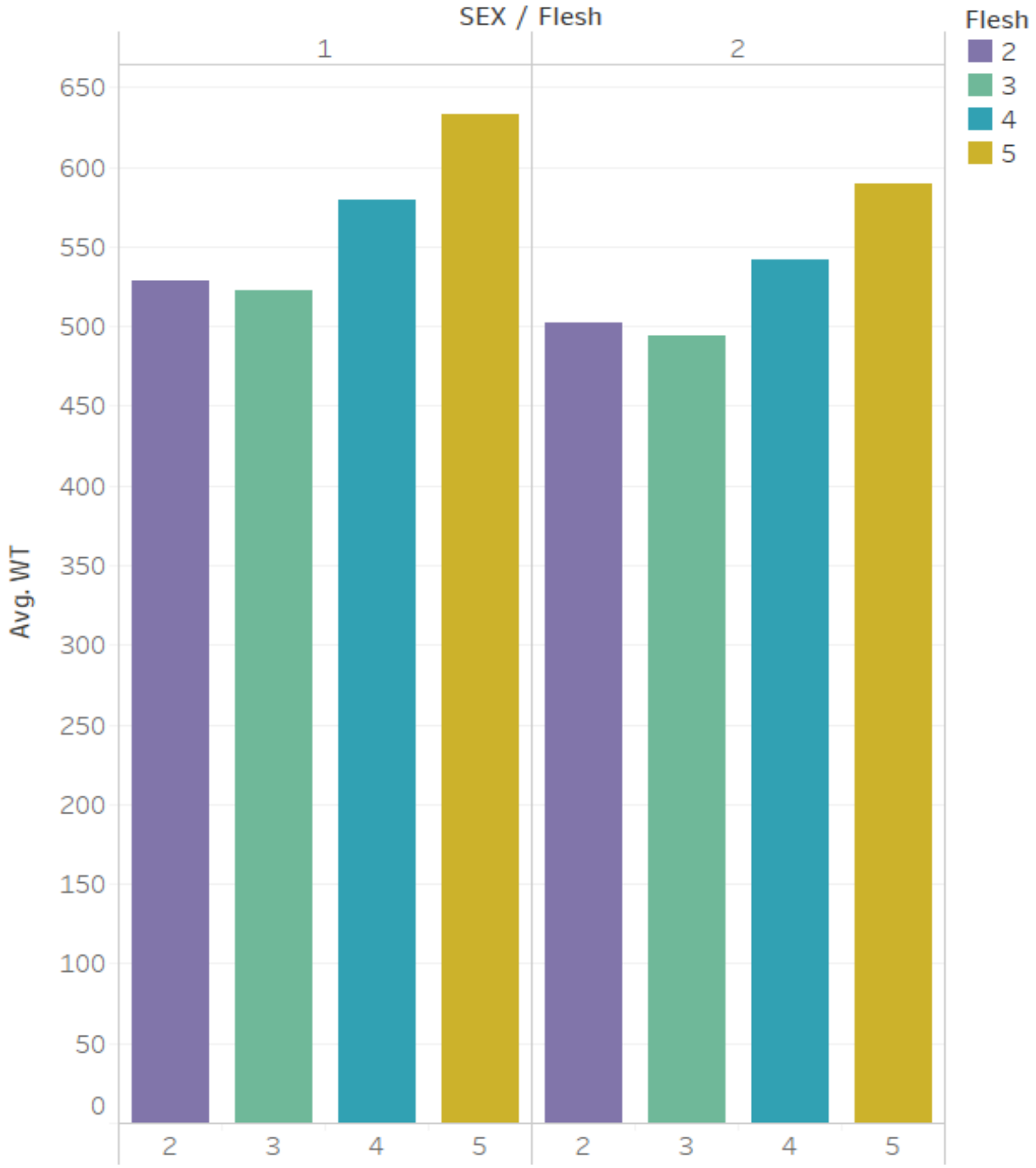
State


Count of LOTID
1
13,267
511
13,267
2,032
166
1
5,679
6,710
3,565
82
8,204
157
460
4,940
222
29
20
3,924
5,994
10,771
3,326
948
25
41
248
2,346
49
385
863
3,726
319
12
167
143
244
10,116
1,689
3,491

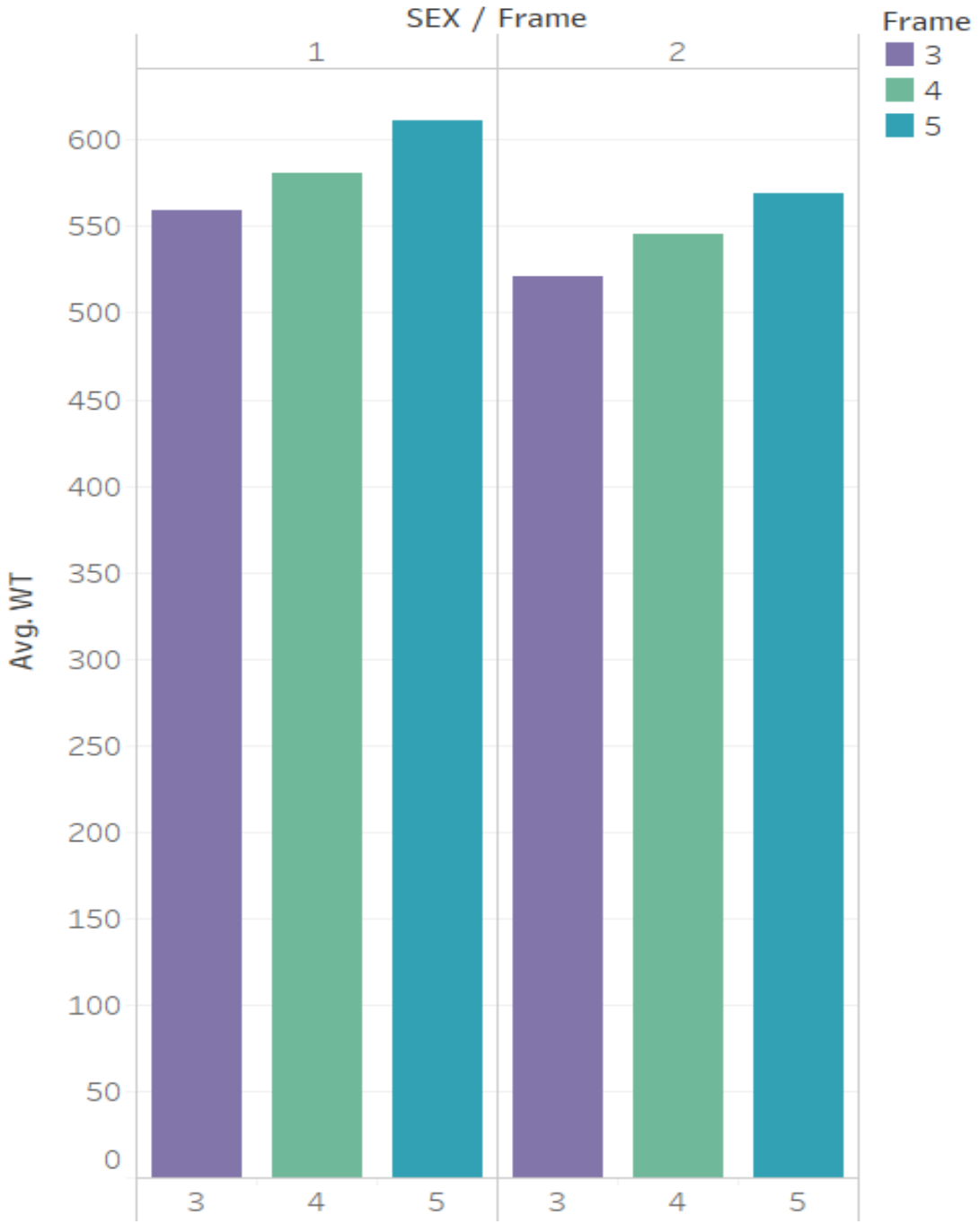
Raw average Sale Price by State



Flesh score by Sex of Calves



Frame Score by Sex of Calves



Feeder Cattle Lots

23,862 lots

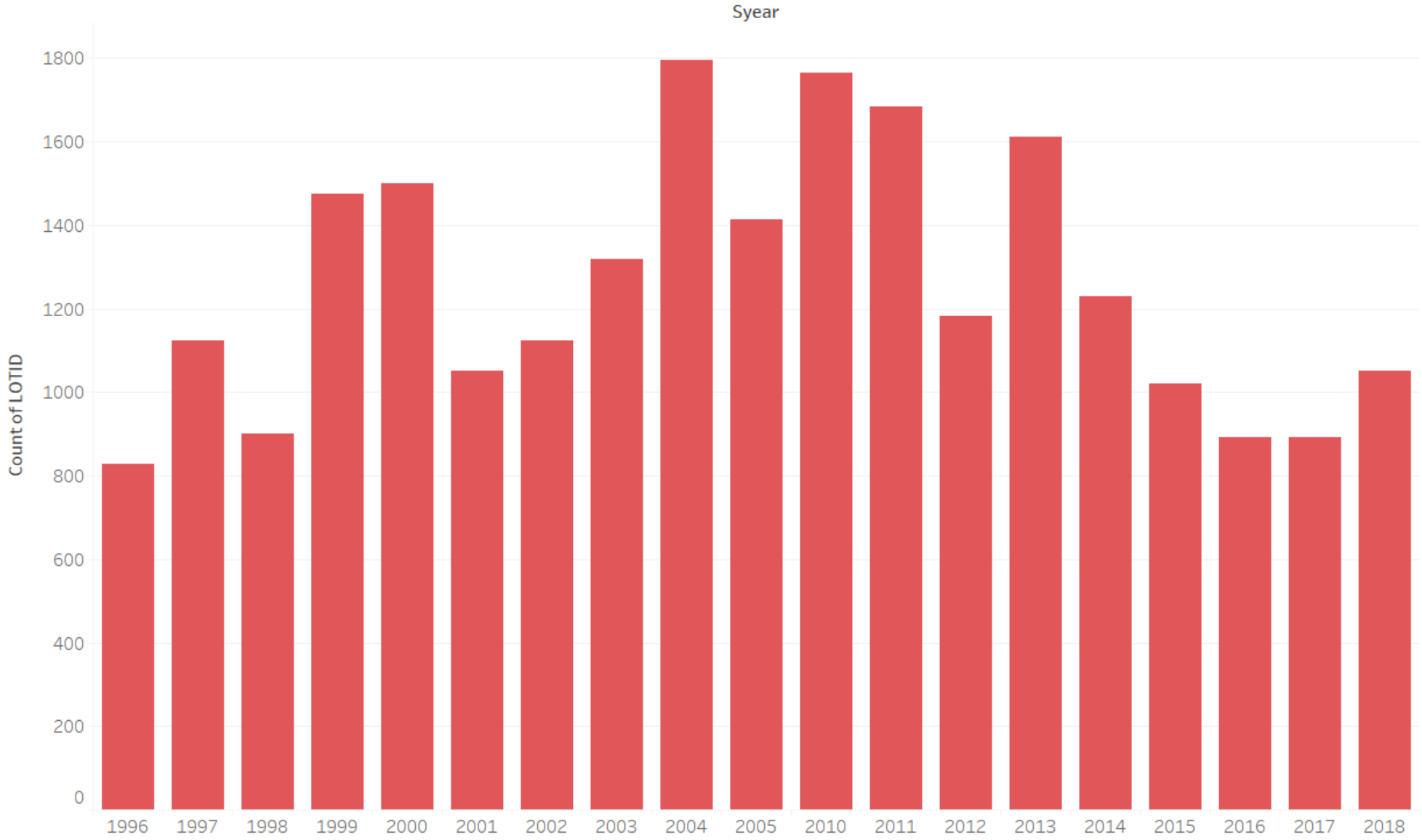
Descriptive Statistics

Factor	Mean	SD	Range
Size of lot (head)	125.9	115.5	4 to 1,800
Weight	783.1	84.9	420 to 1,125
Sale Price ($/cwt)	114.91	40.28	45.00 to 267.00

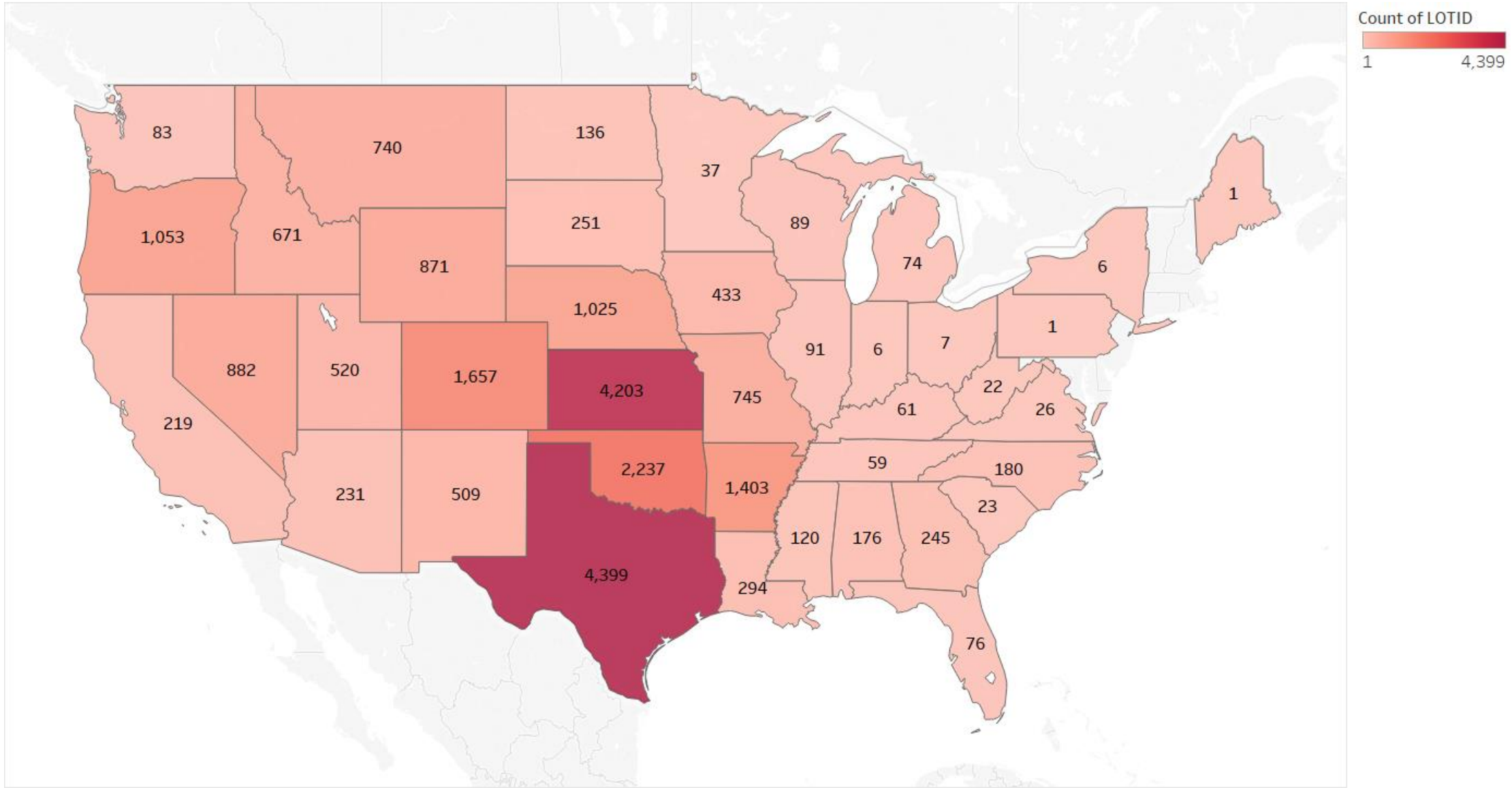
	SYEAR	LOTID	SMONTH	HEAD	SEX	WT	PRICE	STATECODE	SAREA	BREED	FRAME	FLESH	VAC
SYEAR	1.000000												
LOTID	0.990944	1.000000											
SMONTH	-0.103676	-0.064766	1.000000										
HEAD	-0.041727	-0.042079	-0.023245	1.000000									
SEX	-0.057300	-0.053624	0.002478	-0.067081	1.000000								
WT	0.246894	0.241405	-0.106987	0.083327	-0.369070	1.000000							
PRICE	0.835596	0.832601	-0.081078	-0.025014	-0.100595	0.181884	1.000000						
STATECODE	-0.168724	-0.193013	-0.005845	-0.087257	0.060387	-0.250077	-0.106882	1.000000					
SAREA	-0.039077	-0.040503	-0.012720	-0.105415	0.069802	-0.256010	-0.050853	0.876676	1.000000				
BREED	-0.225968	-0.226524	0.013944	0.022269	0.043131	-0.318067	-0.206481	0.392879	0.406660	1.000000			
FRAME	0.138352	0.145319	-0.029735	-0.000113	-0.078557	0.179771	0.129784	-0.058890	-0.021669	0.009941	1.000000		
FLESH	-0.035072	-0.032461	-0.007994	-0.005740	0.001504	0.172594	-0.039477	-0.087592	-0.082012	-0.059608	0.019022	1.000000	
VAC	0.365210	0.366607	-0.009123	-0.067963	-0.012612	0.032489	0.302515	-0.013126	0.040139	-0.113540	0.041786	0.026325	1.000000

Correlations

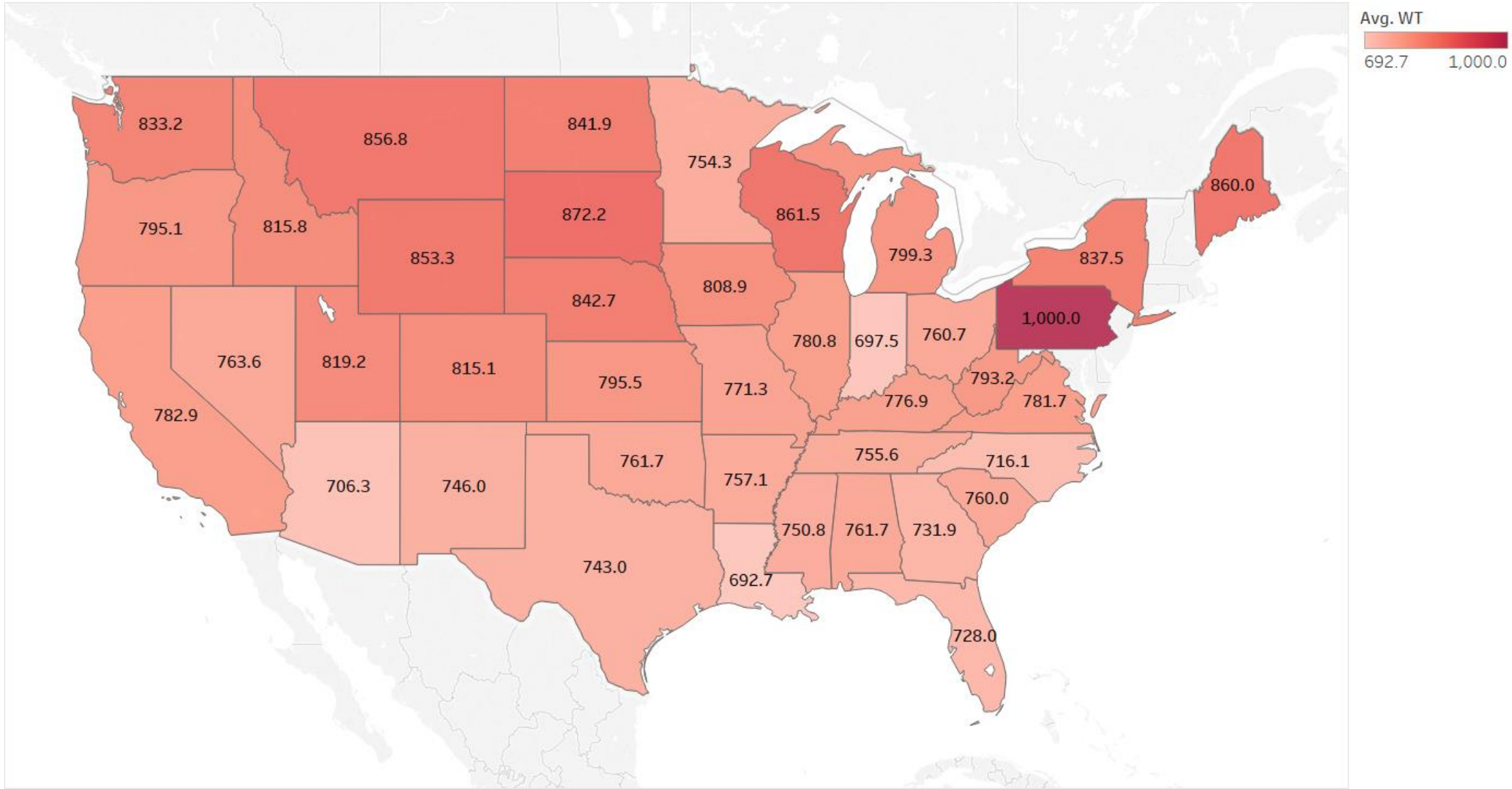
Sale Year


Syear
Count of LOTID
1800
1600
1400
1200
1000
800
600
400
200
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2010
2011
2012
2013
2014
2015
2016
2017
2018

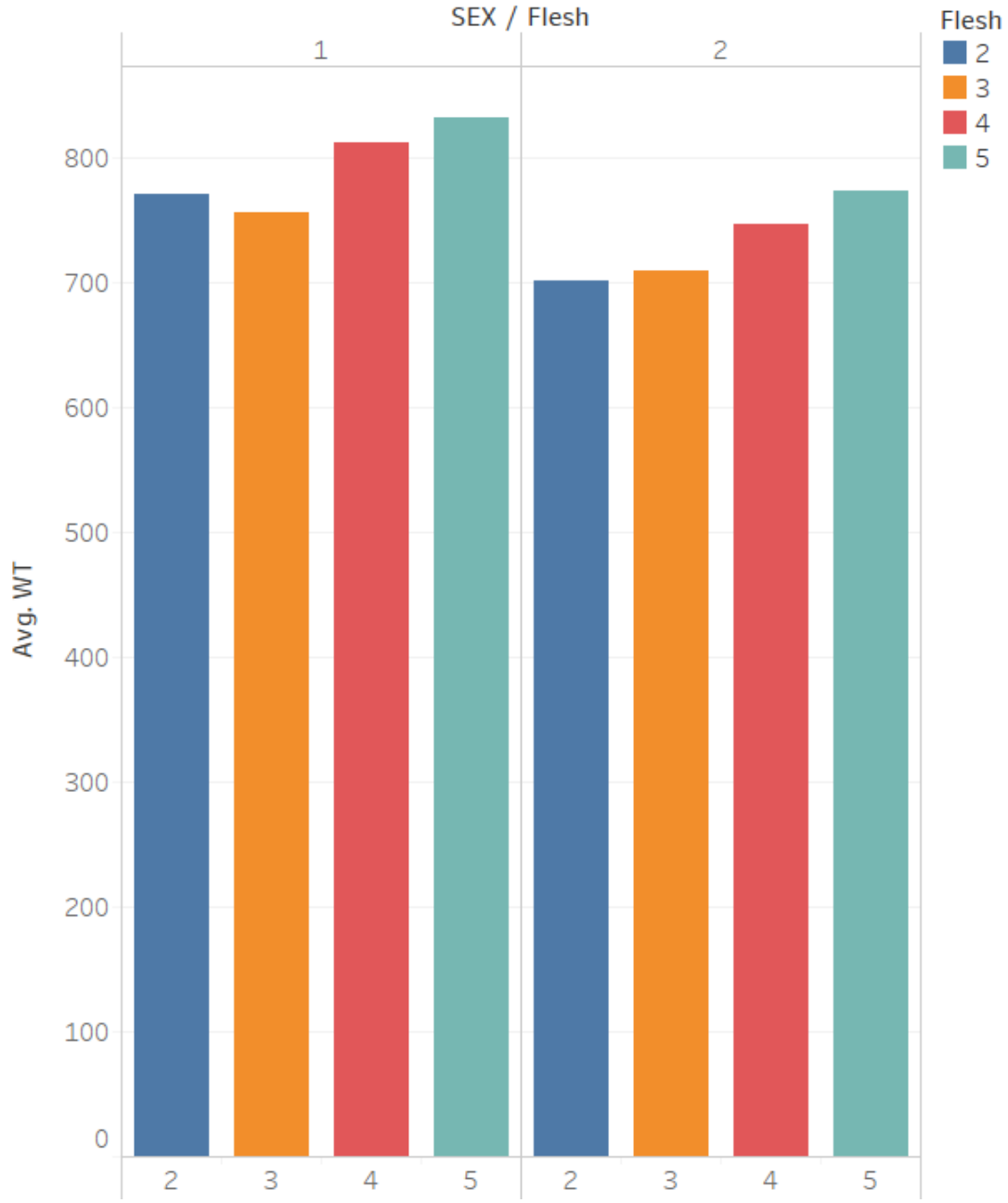
State


Count of LOTID
1
4,399
83
740
136
37
1
1,053
671
871
251
89
74
6
433
1,025
1
882
520
1,657
4,203
91
6
7
745
22
219
61
26
2,237
59
180
231
509
1,403
23
120
176
245
4,399
294
76

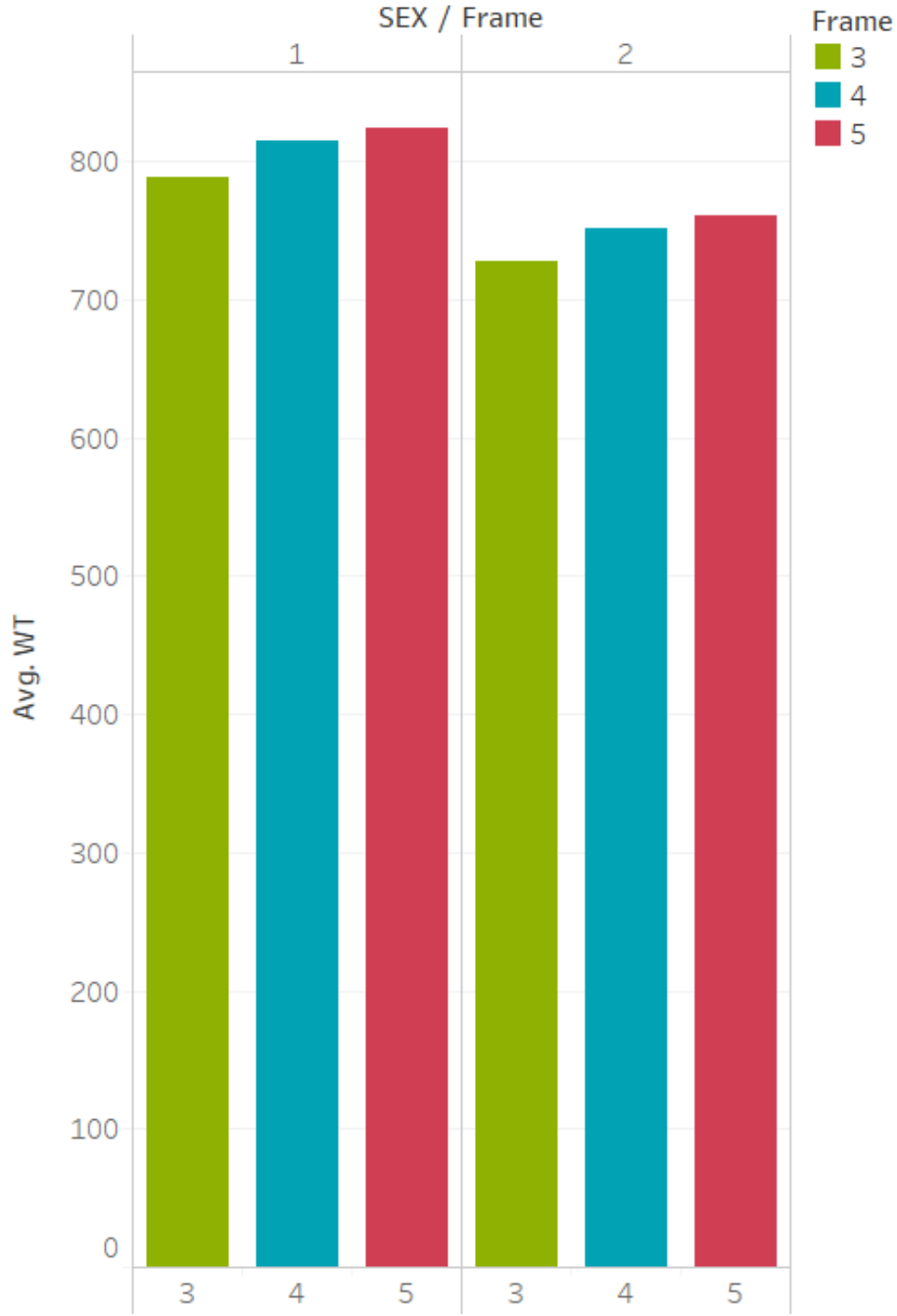
Raw average Sale Price by State



Flesh score by Sex of Feeders



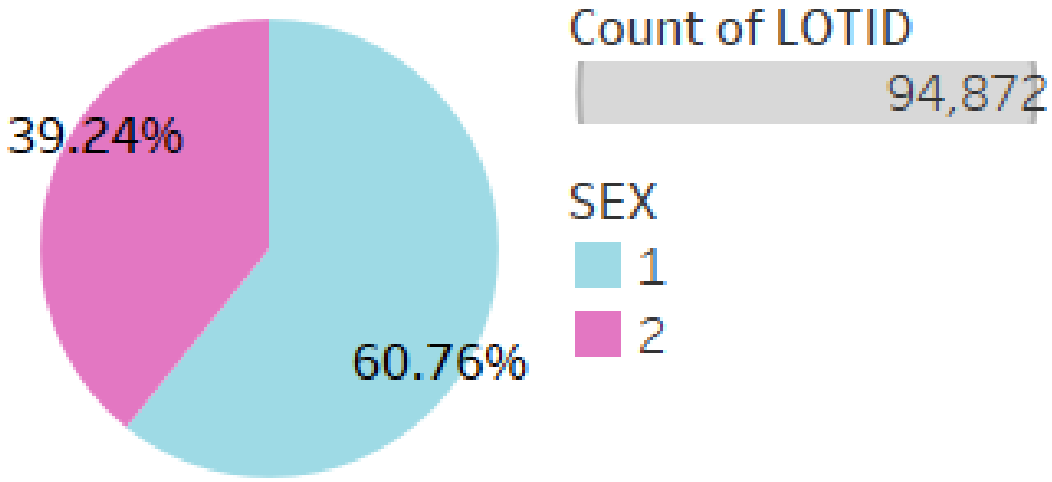
Frame Score by Sex of Feeders



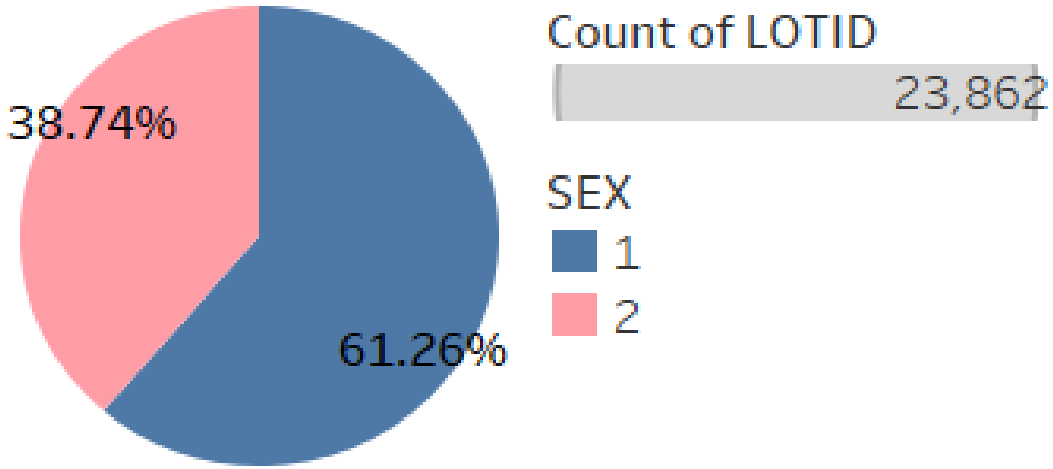
Comparison of Beef Calves and Feeder Cattle Lots

Sex of Lot

Calves

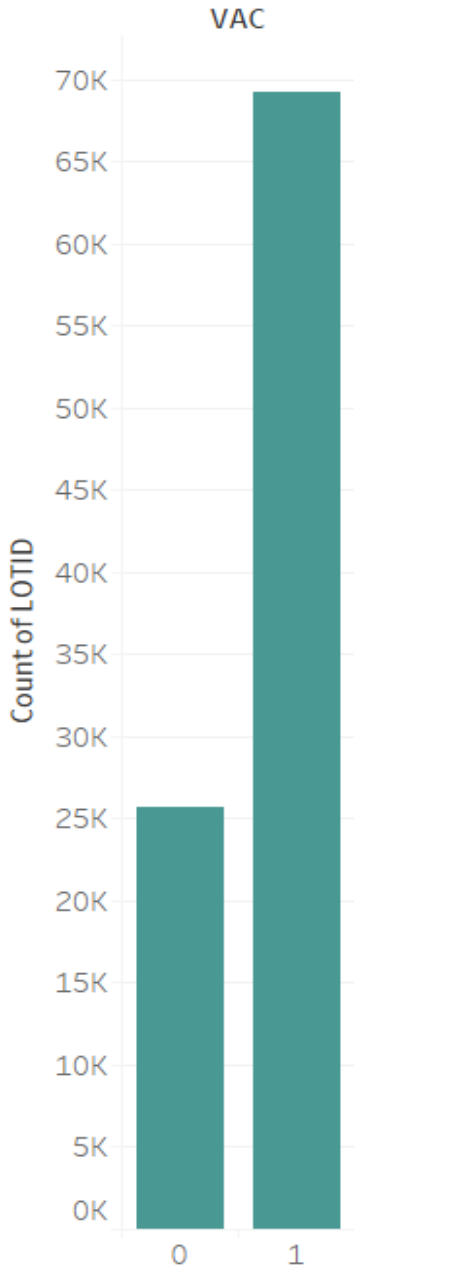


Feeders

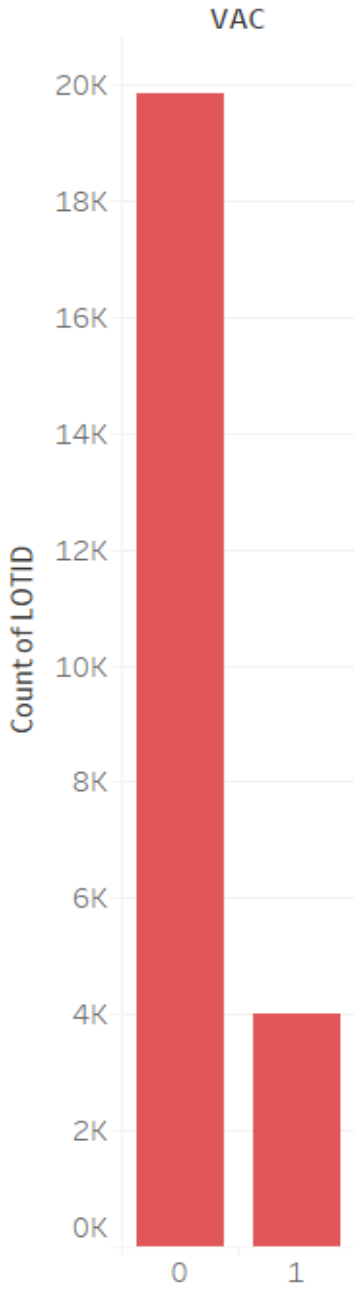


Vaccination Program Qualification

Calves

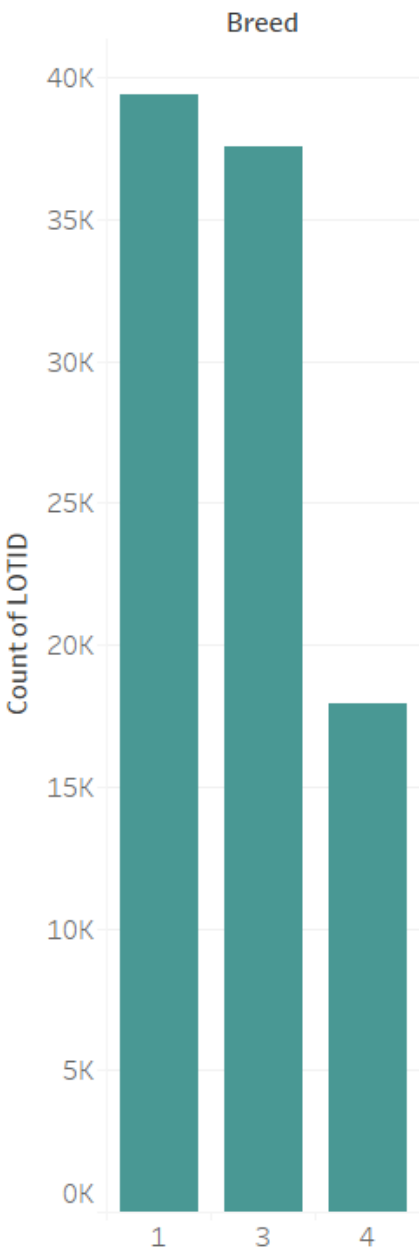


Feeders

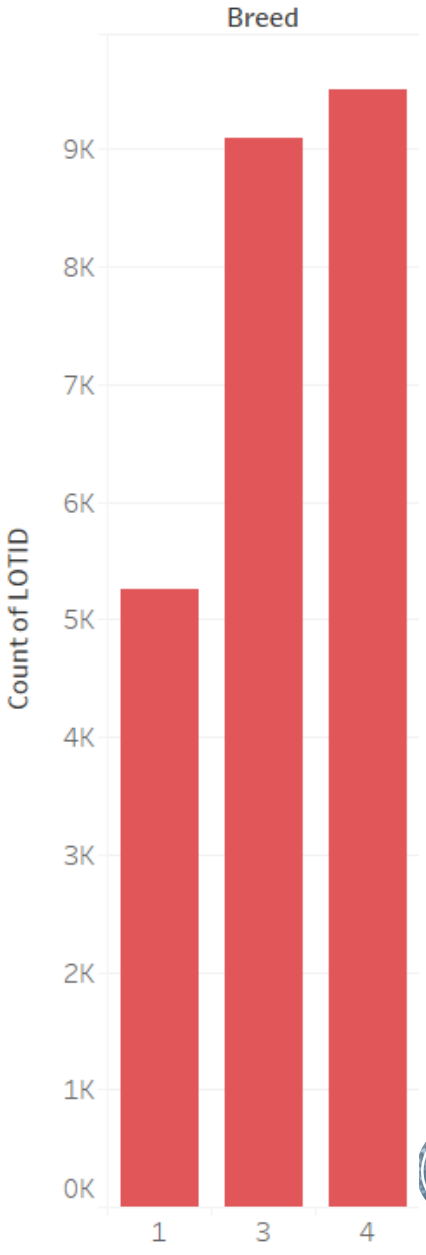


Breed Description

Calves

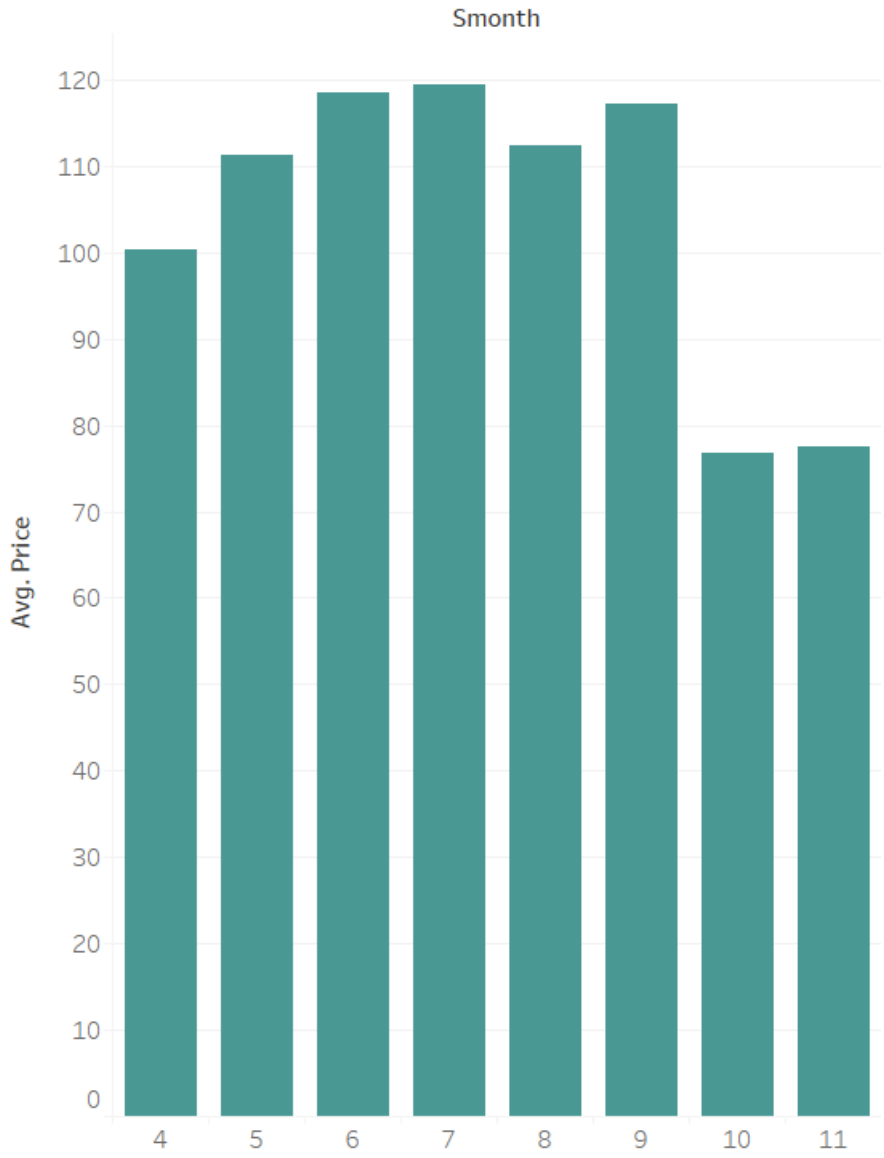


Feeders

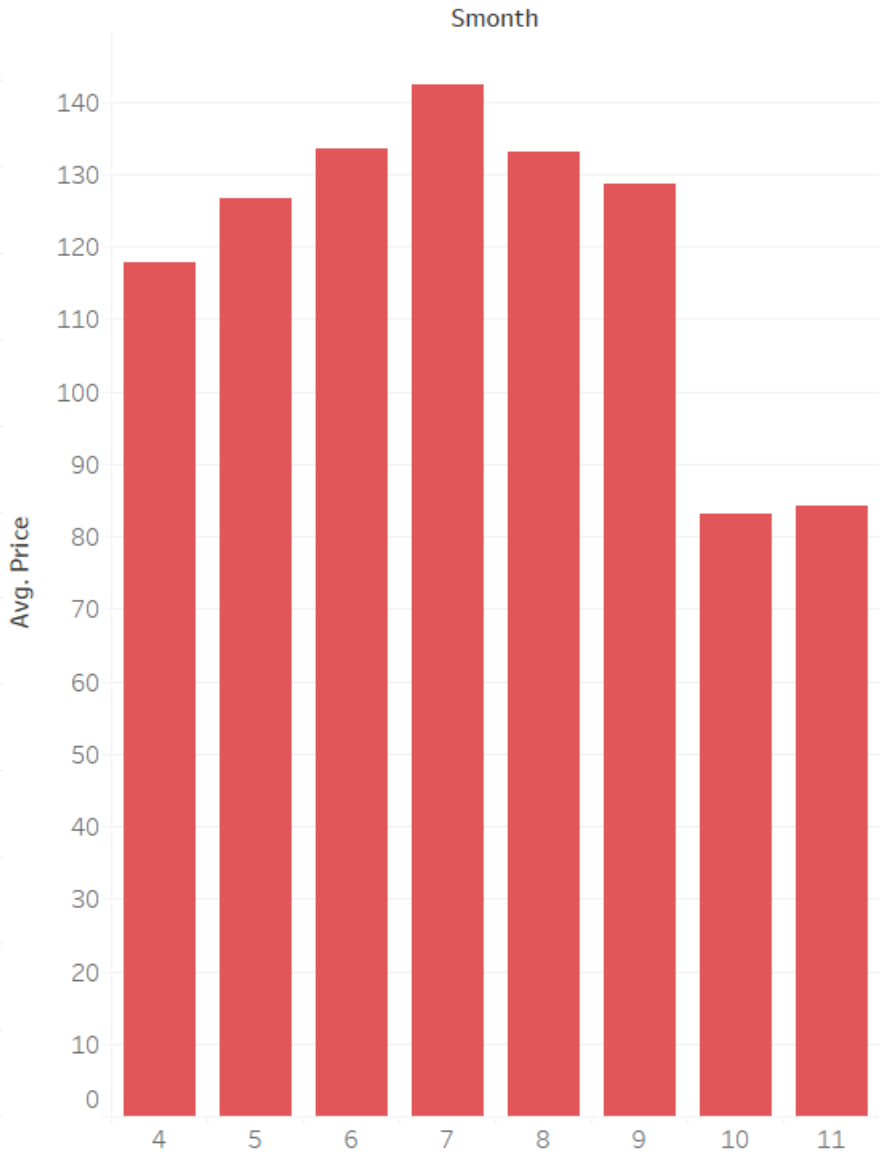


Sale Price by Sale Month

Calves

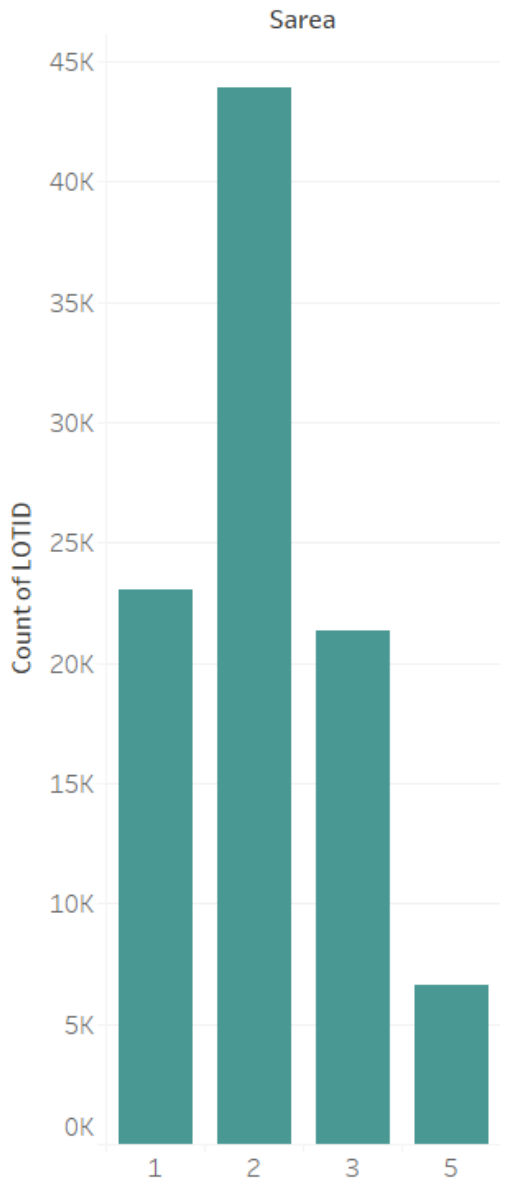


Feeders

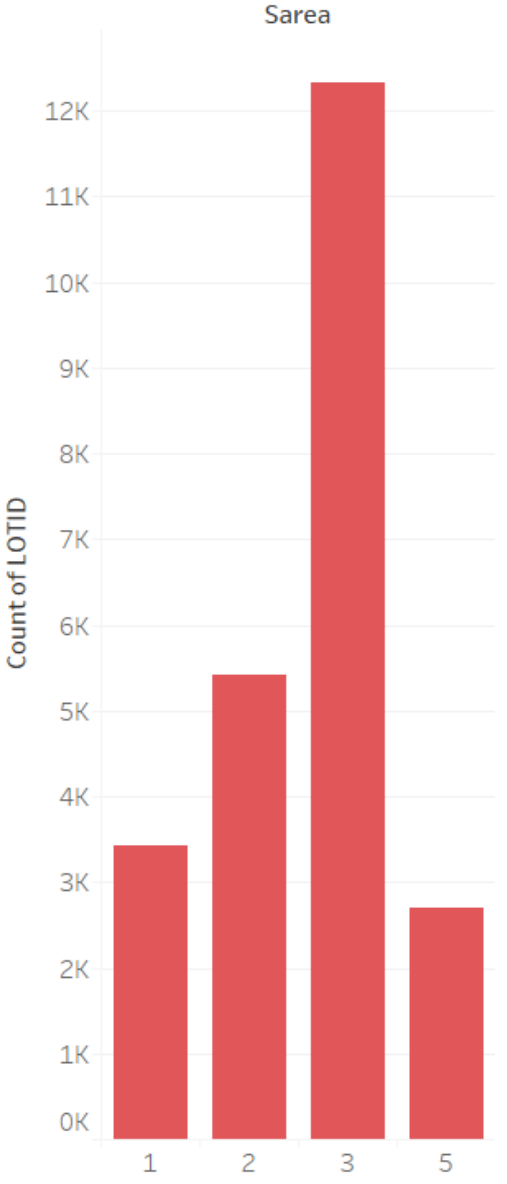


Sale Area/Region

Calves

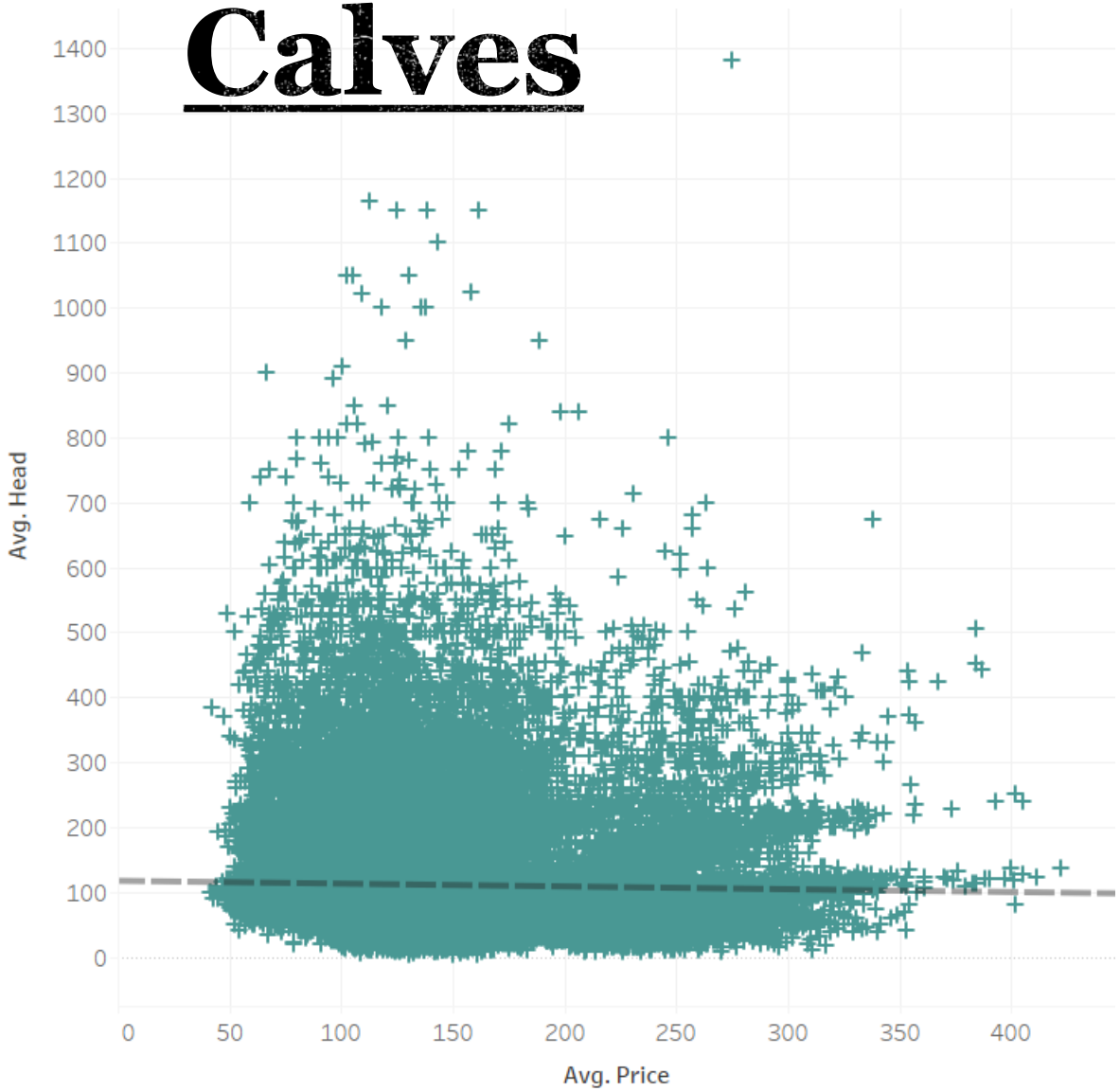


Feeders

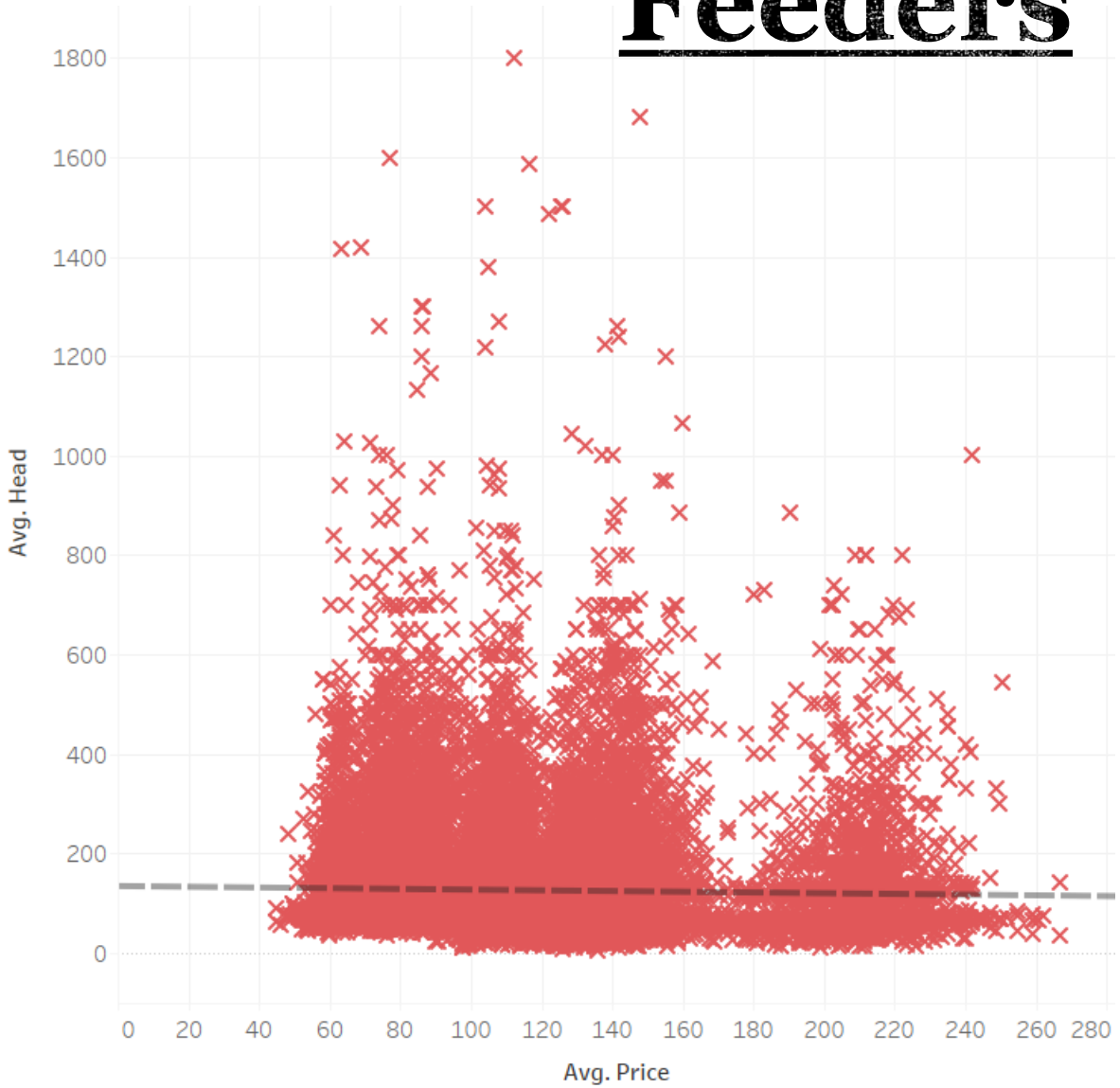


Average Head by Price

Calves

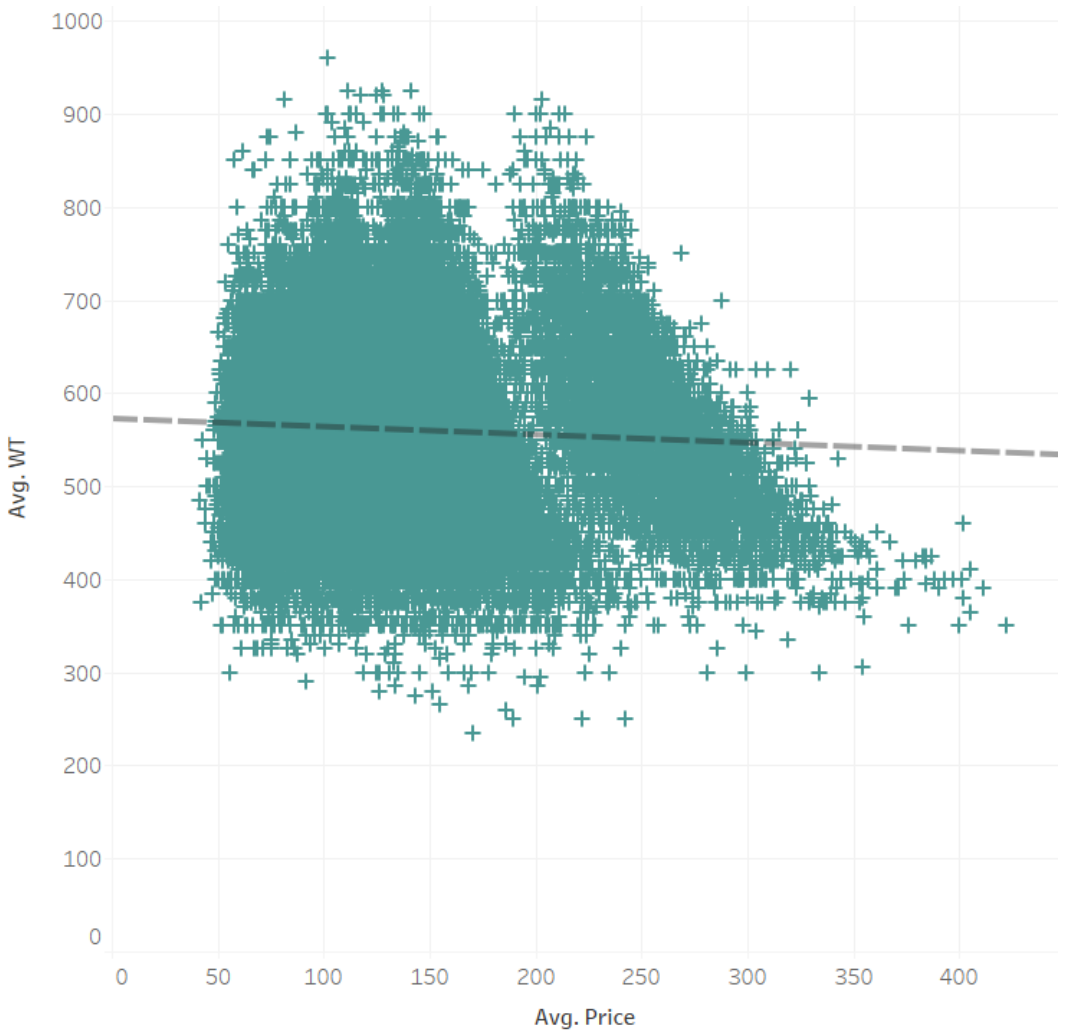


Feeders

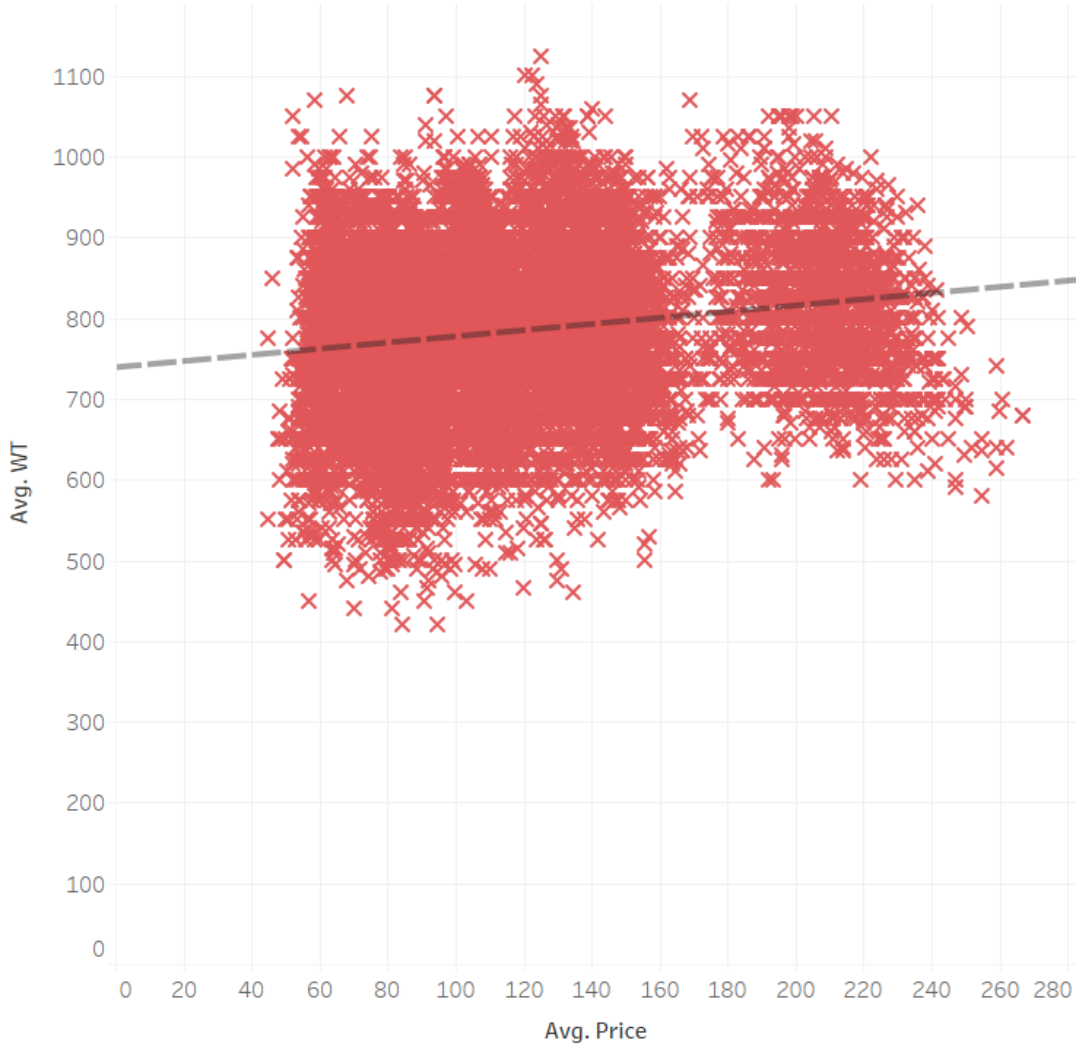


Average Weight by Price

Calves



Feeders



Insights from EDA & Data Visualization

- Poor interpretation of correlations because of categorical variables
- Calves and feeder cattle represent two different populations
  - Be cautious when interpreting comparisons
- Good distributions within each variable
- Need to include both linear and quadratic terms for weight and head (size of lot)
- While different populations, the raw sale price for each sale month appears to follow similar patterns for calves and feeders