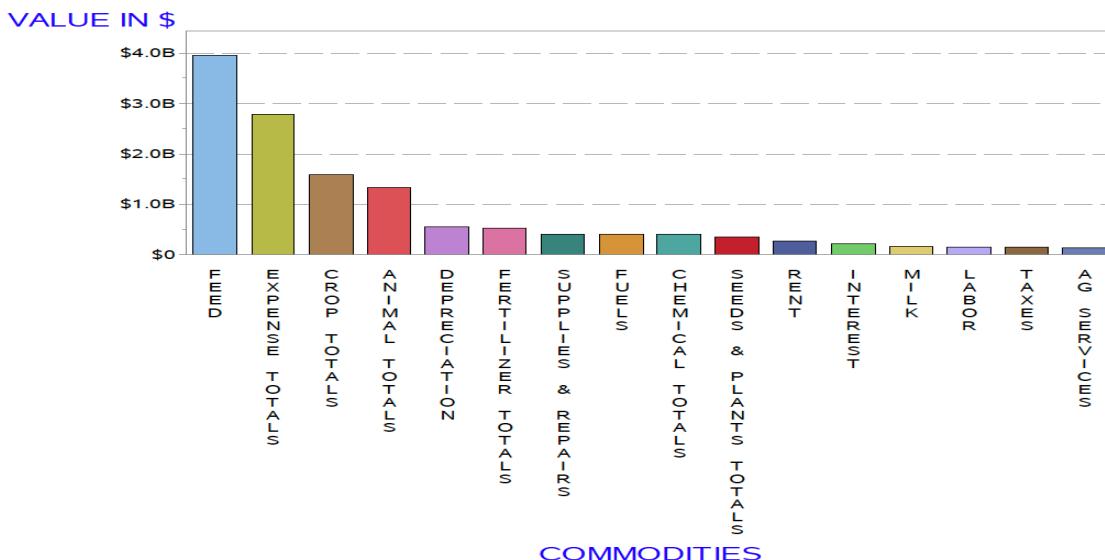


## ANALYSIS OF USDA DATA FOR NORTH CAROLINA BETWEEN 2012 & 2017.

### KEY FINDINGS

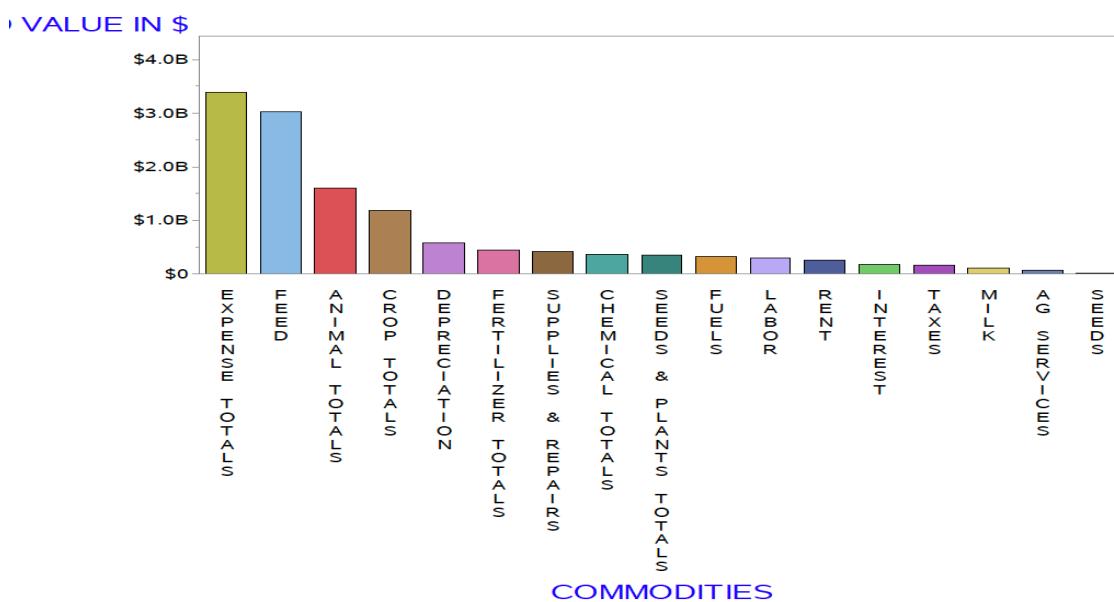
#### 1. Commodities that had the Highest Measured Value In 2012 And 2017.

**COMMODITIES DISTRIBUTION IN NORTH CAROLINA FOR 2012**



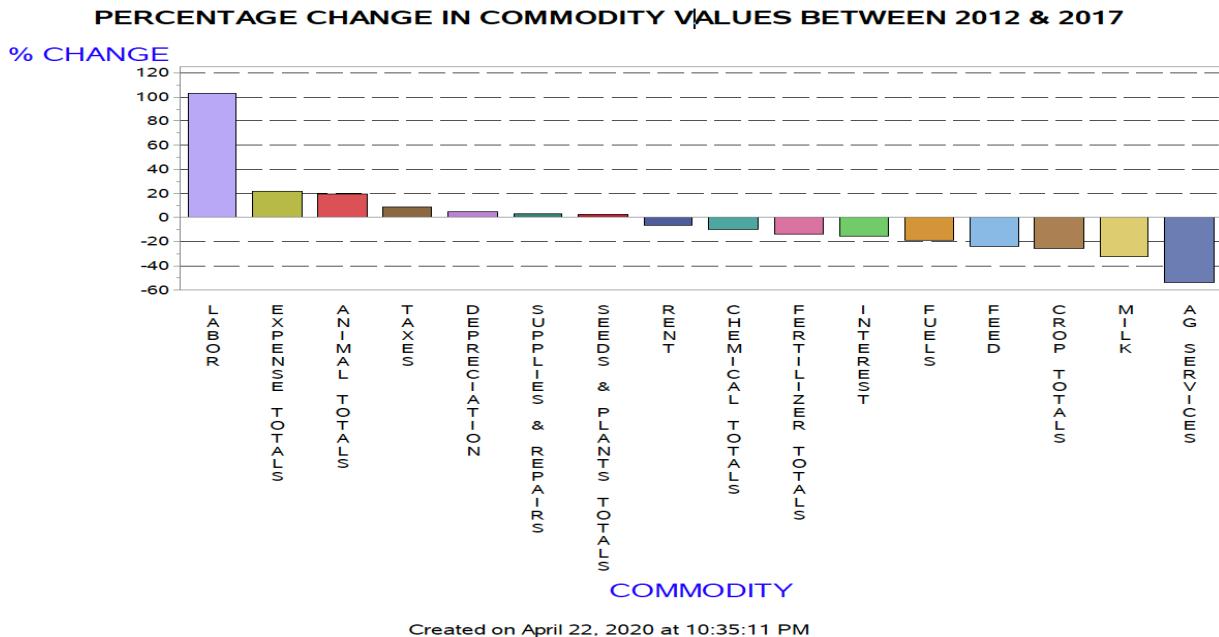
Created on April 22, 2020 at 10:35:10 PM

**COMMODITIES DISTRIBUTION FOR NORTH CAROLINA IN 2017**



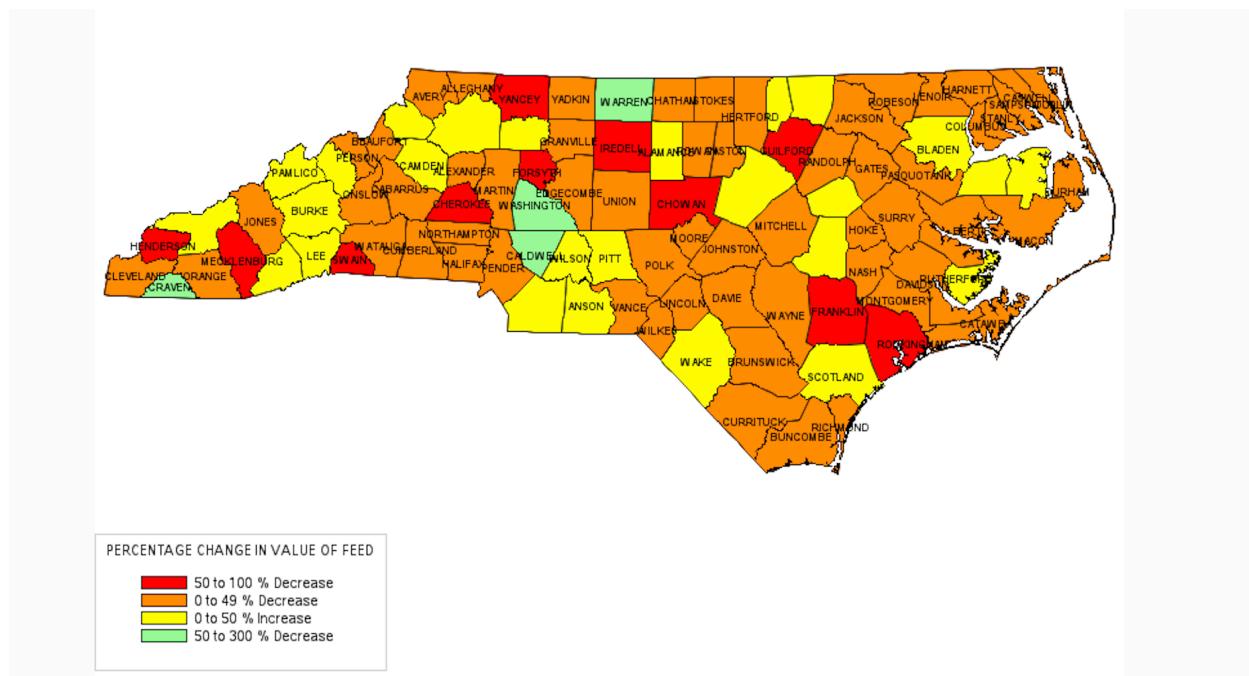
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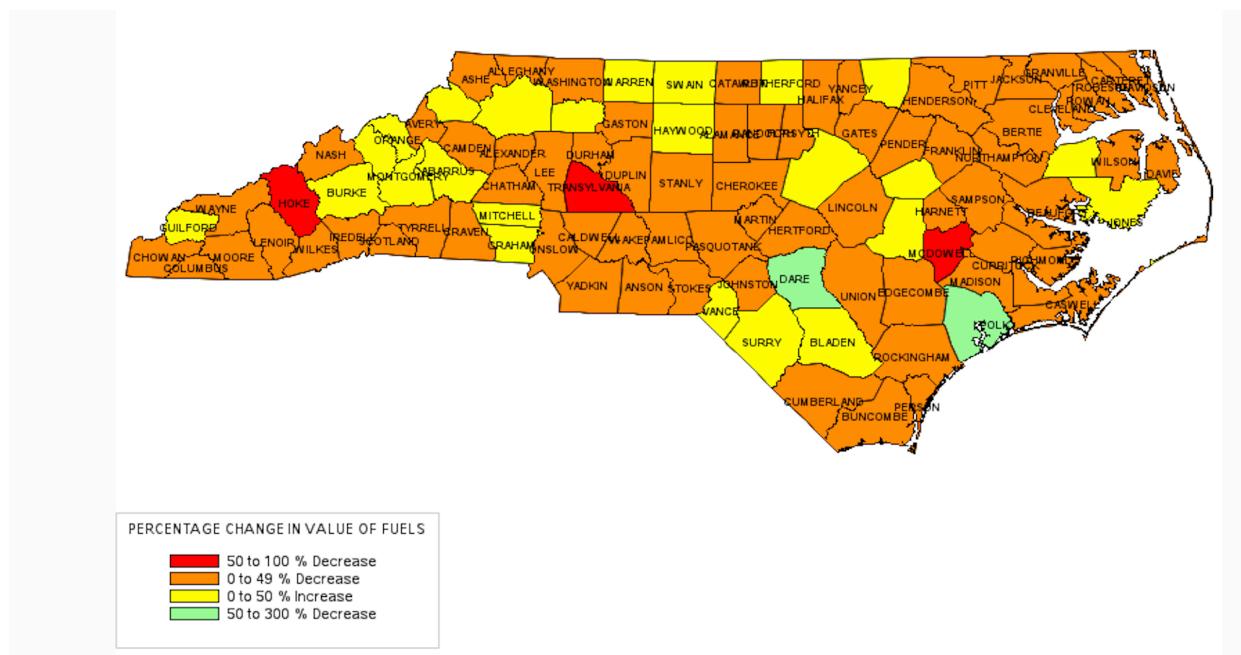
## 2. Commodities that had the Highest Percentage Increase in Values Between 2012 And 2017?



## 3. Map Eyeballing Counties with Highest Increase and Decrease in Percentage Change in Value for Each Commodity.

Map Generated For Feed



**Map Generated For Fuel**

#### 4. Summary Statistics Showing Each Commodity's Percent Change in Value and Other Variables Between 2012 & 2017.

##### Summary Statistics For Feed.

Simple Statistics						
Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Value_Change	86	-16.12093	54.50083	-1386	-64.60000	289.80000
Unemployment_Change	86	-52.43256	5.45811	-4509	-66.00000	-35.00000
Pop_Density_Change	86	1.77209	5.25726	152.40000	-6.40000	16.80000
CLDD_Change	86	2.80930	14.83068	241.60000	-28.20000	86.20000
HTDD_Change	86	0.54884	10.01285	47.20000	-20.20000	51.40000
PRCP_Change	86	8.09070	15.73425	695.80000	-30.40000	42.00000
TAVG_Change	86	0.66512	3.60920	57.20000	-8.80000	15.40000
TMIN_Change	86	2.40233	7.77601	206.60000	-22.20000	31.80000
TMAX_Change	86	0.13953	2.76687	12.00000	-7.00000	10.20000

**Summary Statistics For Fuel.**

Simple Statistics						
Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Value_Change	91	-15.40659	27.95430	-1402	-65.40000	152.80000
Unemployment_Change	91	-52.77143	5.60369	-4802	-66.00000	-35.00000
Pop_Density_Change	91	1.45714	4.76751	132.60000	-6.40000	13.20000
CLDD_Change	91	2.83956	15.38794	258.40000	-26.00000	86.20000
HTDD_Change	91	0.63516	10.16786	57.80000	-20.20000	51.40000
PRCP_Change	91	7.47033	15.56633	679.80000	-30.40000	45.60000
TAVG_Change	91	0.65714	3.78961	59.80000	-8.80000	15.40000
TMIN_Change	91	2.71429	8.29603	247.00000	-22.20000	31.80000
TMAX_Change	91	0.02857	2.91350	2.60000	-7.00000	10.20000

**5. Correlation Matrix of Each Commodity's Percent Change in Value.****Correlation Matrix of Percent Change in Value & for Fuel**

Pearson Correlation Coefficients, N = 91 Prob >  r  under H0: Rho=0			
Value_Change	Value_Change	TMAX_Change	HTDD_Change
	1.00000	-0.18938	0.13929
		0.0722	0.1879
Unemployment_Change	Unemployment_Change	PRCP_Change	TMAX_Change
	1.00000	-0.41042	0.32874
Pop_Density_Change	Pop_Density_Change	HTDD_Change	PRCP_Change
	1.00000	-0.24210	0.21245
		0.0208	0.0432
CLDD_Change	CLDD_Change	TAVG_Change	TMAX_Change
	1.00000	0.90711	0.74939
		<.0001	<.0001
HTDD_Change	HTDD_Change	TAVG_Change	CLDD_Change
	1.00000	-0.30010	-0.27328
		0.0039	0.0088
PRCP_Change	PRCP_Change	Unemployment_Change	TMAX_Change
	1.00000	-0.41042	-0.24153
		<.0001	0.0211
TAVG_Change	TAVG_Change	CLDD_Change	TMIN_Change
	1.00000	0.90711	0.84284
		<.0001	<.0001
TMIN_Change	TMIN_Change	TAVG_Change	CLDD_Change
	1.00000	0.84284	0.73140
TMAX_Change	TMAX_Change	CLDD_Change	TAVG_Change
	1.00000	0.74939	0.74712
		<.0001	<.0001

### Correlation Matrix of Percent Change in Value for Feed

Pearson Correlation Coefficients, N = 86 Prob >  r  under H0: Rho=0					
	Value_Change	Value_Change	PRCP_Change	Pop_Density_Change	
		1.00000	-0.21352	-0.21255	
Unemployment_Change	Unemployment_Change		0.0484	0.0494	
		1.00000	PRCP_Change -0.30121	TMAX_Change 0.25978	
Pop_Density_Change	Pop_Density_Change		0.0048	0.0157	
		1.00000	PRCP_Change 0.31589	HTDD_Change -0.27887	
CLDD_Change	CLDD_Change		0.0030	0.0093	
		1.00000	TAVG_Change 0.89820	TMAX_Change 0.74086	
HTDD_Change	HTDD_Change		<.0001	<.0001	
		1.00000	TAVG_Change -0.27986	Pop_Density_Change 0.0093	
PRCP_Change	PRCP_Change		0.0091	Unemployment_Change -0.30121	
		1.00000	Pop_Density_Change 0.31589	0.0030	
TAVG_Change	TAVG_Change		CLDD_Change 0.89820	TMIN_Change 0.84973	
		1.00000	<.0001	<.0001	
TMIN_Change	TMIN_Change		TAVG_Change 0.84973	CLDD_Change 0.72615	
		1.00000	<.0001	<.0001	
TMAX_Change	TMAX_Change		CLDD_Change 0.74086	TAVG_Change 0.73351	
		1.00000	<.0001	<.0001	

## 6. Linear Regression Model to Predict Change in Value of Each Commodity Using The Top 2 Predictive Variables.

Note: Each Commodity Has Different Top Predictors.

**Below Is A Linear Regression Model for Feed With % Change in Population Density And % Change In Unemployment Rate As Top Predictive Variables.**

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	12073.3323	6036.6661	2.08	0.1309
Error	83	240405.5701	2896.4527		
Corrected Total	85	252478.9023			
<hr/>					
R-Square	Coeff Var	Root MSE	Value_Change Mean		
0.047819	-333.8436	53.81870	-16.12093		
<hr/>					
Source	DF	Type I SS	Mean Square	F Value	Pr > F
Pop_Density_Change	1	11406.18262	11406.18262	3.94	0.0505
Unemployment_Change	1	667.14965	667.14965	0.23	0.6325
<hr/>					
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Pop_Density_Change	1	11820.32417	11820.32417	4.08	0.0466
Unemployment_Change	1	667.14965	667.14965	0.23	0.6325
<hr/>					
Parameter	Estimate	Standard Error	t Value	Pr >  t	
Intercept	14.89820653	56.82793574	0.26	0.7938	
Pop_Density_Change	-2.25261717	1.11507971	-2.02	0.0466	
Unemployment_Change	0.51546769	1.07404637	0.48	0.6325	

**Below Is A Linear Regression Model for Fuel With % Change in Population Density And % Change In Unemployment Rate As Top Predictive Variables.**

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1673.46678	836.73339	1.07	0.3466
Error	88	68656.40927	780.18647		
Corrected Total	90	70329.87604			

R-Square	Coeff Var	Root MSE	Value_Change Mean
0.023795	-181.2978	27.93182	-15.40659

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Pop_Density_Change	1	437.594772	437.594772	0.56	0.4559
Unemployment_Change	1	1235.872004	1235.872004	1.58	0.2115

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Pop_Density_Change	1	328.174476	328.174476	0.42	0.5183
Unemployment_Change	1	1235.872004	1235.872004	1.58	0.2115

Parameter	Estimate	Standard Error	t Value	Pr >  t
Intercept	-49.82476645	28.04964403	-1.78	0.0791
Pop_Density_Change	-0.40175596	0.61945411	-0.65	0.5183
Unemployment_Change	-0.66330569	0.52701889	-1.26	0.2115