Coefficients:

Step 1: The coefficient for SoyaBeans is 0.003 ($p<0.001$), indicating a significant positive relationship with Beef_Value_SlaughterMarket.

Step 2: The coefficients for SoyaBeans and BeefConsumption_US are 0.002 ($p<0.001$) and -5.840 ($p<0.001$), respectively, indicating significant positive and negative relationships with Beef_Value_SlaughterMarket.

Excluded Variables: This table shows the variables that were not included in the model, along with their p-values and collinearity statistics. None of the excluded variables met the criteria for inclusion in the model.

Collinearity Diagnostics: The collinearity diagnostics table indicates that multicollinearity is not a major concern in this model. The variance inflation factors (VIF) for both predictor variables (SoyaBeans and BeefConsumption_US) are close to 1, which is an acceptable level.

In conclusion, the stepwise regression analysis resulted in a model with two significant predictor variables, SoyaBeans and BeefConsumption_US, which together explain about 70.9% of the variability in the Beef_Value_SlaughterMarket.

Regression – SPSS stepwise

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	SoyaBeans	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	BeefConsumption_US	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Beef_Value_SlaughterMarket

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.686[a]	.470	.441	9.16725	.470	15.964	1	18	<.001
2	.860[b]	.740	.709	6.61327	.269	17.587	1	17	<.001

a. Predictors: (Constant), SoyaBeans

b. Predictors: (Constant), SoyaBeans, BeefConsumption_US

c. Dependent Variable: Beef_Value_SlaughterMarket

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1341.606	1	1341.606	15.964	<.001[b]
	Residual	1512.692	18	84.038		
	Total	2854.298	19			
2	Regression	2110.798	2	1055.399	24.132	<.001[c]
	Residual	743.500	17	43.735		
	Total	2854.298	19			

a. Dependent Variable: Beef_Value_SlaughterMarket

b. Predictors: (Constant), SoyaBeans

c. Predictors: (Constant), SoyaBeans, BeefConsumption_US

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-17.379	19.198		-.905	.377	-57.713	22.955		
	SoyaBeans	.003	.001	.686	3.996	<.001	.001	.004	1.000	1.000
2	(Constant)	149.724	42.184		3.549	.002	60.723	238.724		
	SoyaBeans	.002	.000	.588	4.669	<.001	.001	.003	.966	1.035
	BeefConsumption_US	-5.840	1.393	-.528	-4.194	<.001	-8.778	-2.902	.966	1.035

a. Dependent Variable: Beef_Value_SlaughterMarket

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	BeefConsumption_US	-.528[b]	-4.194	<.001	-.713	.966	1.035	.966
	Beef_Production_BillionPounds	-.227[b]	-1.356	.193	-.312	1.000	1.000	1.000
	Barley	.056[b]	.235	.817	.057	.547	1.829	.547
	Maize	-.267[b]	-.747	.465	-.178	.236	4.244	.236
	Sorghum	-.393[b]	-1.623	.123	-.366	.460	2.173	.460
	Precipitation	-.029[b]	-.146	.885	-.035	.790	1.266	.790
	AvgTemp	.066[b]	.353	.728	.085	.877	1.140	.877
2	Beef_Production_BillionPounds	.106[c]	.692	.499	.170	.669	1.495	.646
	Barley	-.325[c]	-1.855	.082	-.421	.436	2.292	.436
	Maize	-.276[c]	-1.089	.292	-.263	.236	4.245	.234
	Sorghum	-.266[c]	-1.484	.157	-.348	.446	2.243	.431
	Precipitation	-.087[c]	-.611	.550	-.151	.782	1.278	.778
	AvgTemp	.107[c]	.802	.435	.196	.872	1.147	.842

a. Dependent Variable: Beef_Value_SlaughterMarket

b. Predictors in the Model: (Constant), SoyaBeans

c. Predictors in the Model: (Constant), SoyaBeans, BeefConsumption_US

Collinearity Diagnostics[a]

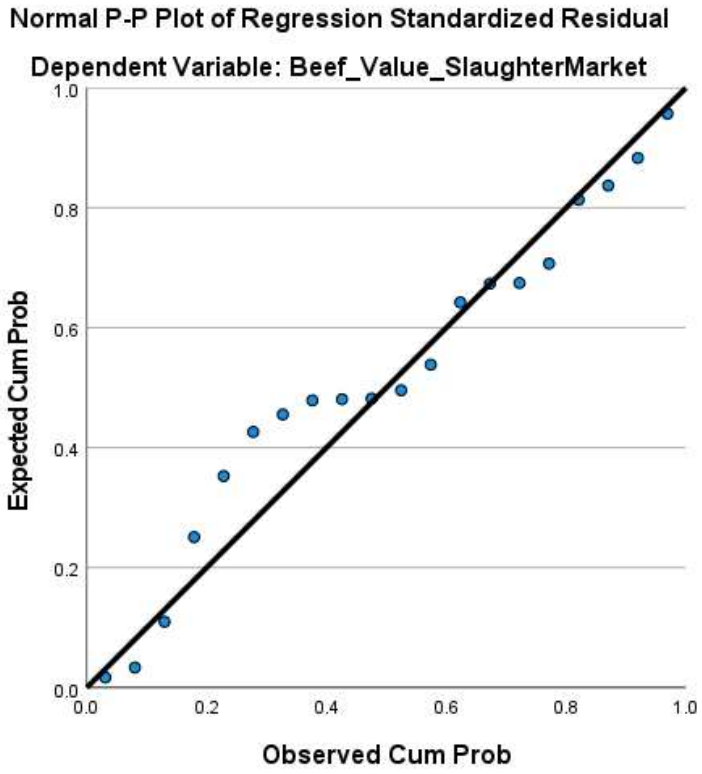
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	SoyaBeans	BeefConsumption_US
1	1	1.994	1.000	.00	.00	
	2	.006	18.678	1.00	1.00	
2	1	2.991	1.000	.00	.00	.00
	2	.009	18.725	.01	.85	.04
	3	.001	65.233	.99	.15	.96

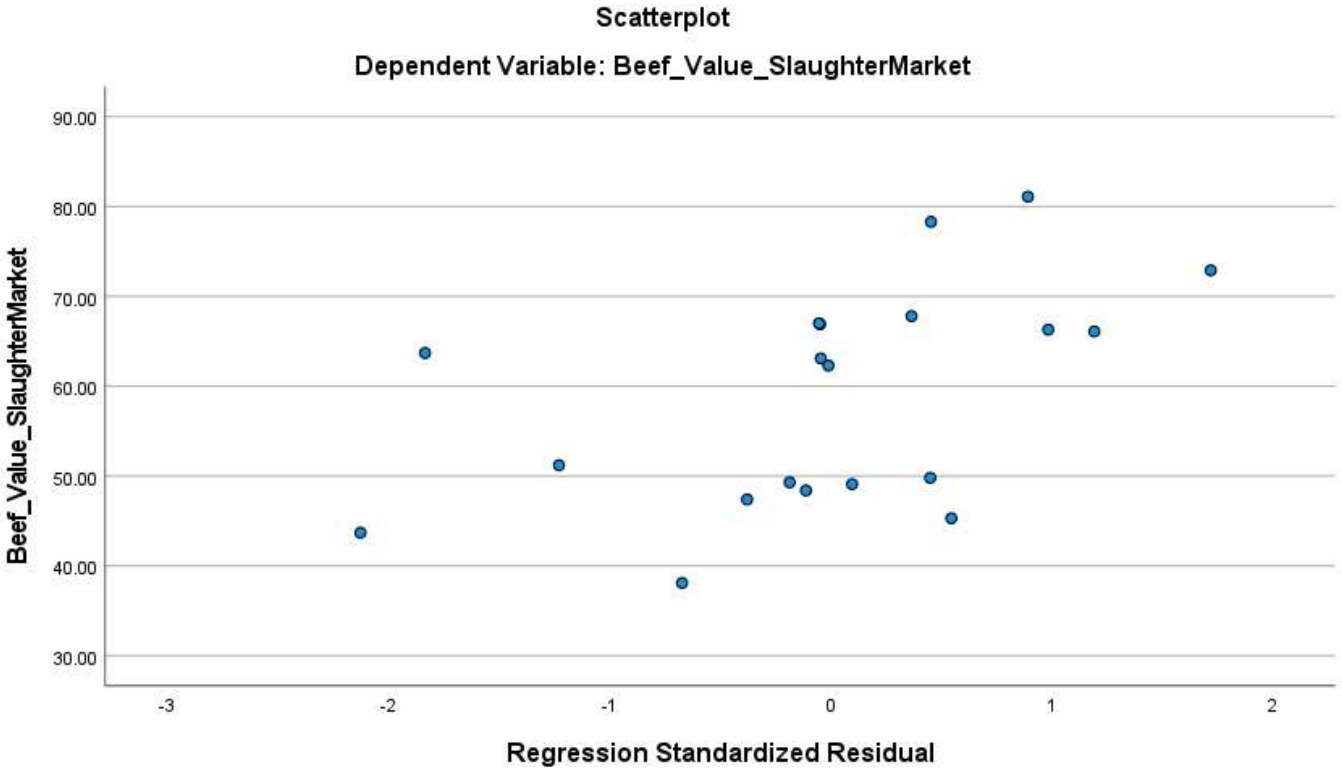
a. Dependent Variable: Beef_Value_SlaughterMarket

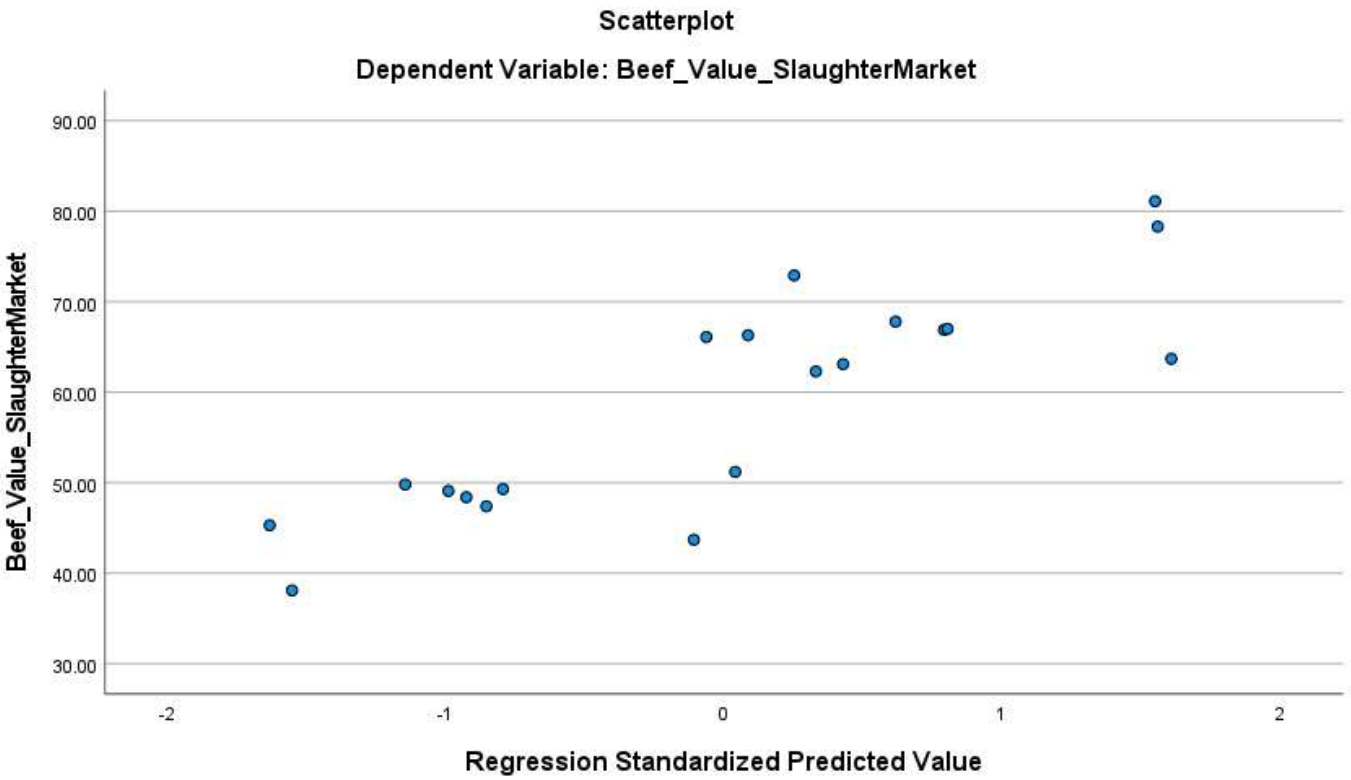
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	41.6968	75.8221	58.8900	10.54014	20
Std. Predicted Value	-1.631	1.606	.000	1.000	20
Standard Error of Predicted Value	1.491	3.644	2.500	.572	20
Adjusted Predicted Value	40.1262	78.7104	58.6208	10.66014	20
Residual	-14.05064	11.35390	.00000	6.25552	20
Std. Residual	-2.125	1.717	.000	.946	20
Stud. Residual	-2.181	1.987	.019	1.029	20
Deleted Residual	-15.01043	15.20410	.26924	7.43039	20
Stud. Deleted Residual	-2.493	2.200	.002	1.114	20
Mahal. Distance	.015	4.818	1.900	1.277	20
Cook's Distance	.000	.446	.065	.118	20
Centered Leverage Value	.001	.254	.100	.067	20

a. Dependent Variable: Beef_Value_SlaughterMarket


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Beef_Value_SlaughterMarket
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: Beef_Value_SlaughterMarket
Beef_Value_SlaughterMarket
Regression Standardized Residual
90.00
80.00
70.00
60.00
50.00
40.00
30.00
-3
-2
-1
0
1
2



Section V: Conclusion and Discussion

In both models, the significant relationships between the dependent variable and the two predictors (SoyaBeans and BeefConsumption_US) are consistent, with SoyaBeans having a positive relationship and BeefConsumption_US having a negative relationship. Overall, the two models have the same predictor variables and show similar results in terms of adjusted R-squared values and the relationships between the dependent variable and predictors. The stepwise regression model automated the process of selecting significant predictors, while the manual removal of variables allowed for a more controlled approach. In this case, both methods led to the same conclusion.

1. An increase in the production of primary feed crops, such as maize and soya beans, leads to an increase in beef production.
2. Climatic factors, such as temperature and precipitation, have a direct impact on beef production.
3. Changes in consumer preferences and dietary habits can impact beef production.

Our analysis of the factors influencing the total value of beef at slaughter markets has revealed the complex interplay of various variables, including crop production, climatic factors, cattle population, and meat consumption. By using a stepwise regression model, we have identified the most significant factors and provided insights into their impact on beef production. This knowledge can help stakeholders in the beef industry make informed decisions and implement strategies to optimize production while addressing the challenges posed by changing consumer preferences, climate conditions, and global food security concerns. It's important to consider that the model may not capture all the complexities and nuances of the real-world situation. Although maize is essential for cattle production and climatic factors play a significant role in crop growth, these variables were not found to be significant predictors of the Beef_Value_SlaughterMarket in the current model. Given the knowledge that climatic factors play a role in crop production we should explore these interactions further and compare models.