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Animal Feed Transportation to Georgia

Executive Summary

Georgia is a major broiler producer in the United States but relies on out-of-state grain supplies due to its grain deficit. This study examines trends in animal feed needs in Georgia and the broader Southeast region from 2006 to 2022. The findings indicate that Georgia's corn feed needs have fluctuated significantly, influenced by its corn production, while soybean meal-equivalent demand has remained relatively stable. Modal share estimates for corn and soybean meal equivalent movements show the critical role of rail transportation in delivering field crops to the region. Trucks play an increasingly important role in corn shipments into Georgia. Consequently, disruptions in rail and truck transportation—whether due to weather events, labor strikes, or fuel price volatility—can be significant risks for stakeholders along the supply chain.

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Introduction

Efficient grain transportation is critical for livestock producers across the United States, particularly for those dependent on external sources for animal feed. Over seventy-five percent of grain shipments in the United States are consumed domestically rather than exported (Henderson, Gastelle, and Caffarelli, 2023). A significant portion of this domestic grain is used as feed for livestock and poultry, with southeastern states representing a unique case. This region has a large livestock and poultry population but faces a substantial feed grain deficit. Georgia, as a leading broiler producer in the nation, heavily relies on grain, oilseed, and feed imports from the Midwest and occasionally from international sources to supplement its limited local production. We examine animal feed transportation trends in Georgia, focusing on the relationship between animal feed demand and feed flows into the state. Understanding these dynamics is vital for evaluating the profitability of Georgia's livestock industry and planning potential infrastructure investments.

Background

The Southeastern region is a hub for poultry and livestock production. This is largely attributed to the historical origins of the broiler industry in the Southern United States, the strategic placement of perishable products like milk near end-consumers, and the region's favorable weather conditions, such as mild winters, which benefit certain types of livestock (Jo and Secor, 2024a). In 2023, the Southeast produced 6.5 billion broilers, accounting for 71 percent of total U.S. production (USDA, 2024a).

Georgia stands out as the nation's largest broiler producer, generating 1.3 billion birds—representing 21 percent of the Southeast's total broiler production—followed closely by Alabama, which produced 1.2 billion birds in 2023. Despite its significant presence in livestock and poultry production, the Southeastern states do not have sufficient feed grain production to meet livestock and poultry needs. These states collectively contributed only 6.1 percent of total U.S. corn production and 12 percent of U.S. soybean production in 2023 (USDA, 2024b; 2024c). Georgia's contributions were smaller, producing just 8.2 percent of the Southeast's total corn production and 1.3 percent of its soybean production during the same period (USDA, 2024b; 2024c). As a

result, Georgia requires substantial imports of grain, oilseed, and feed products, occasionally turning to international sources to meet the demands of its livestock and poultry industry.

The demand dynamics for transporting feed grain to the Southeast, particularly Georgia, from outside the Southeast is closely related to the profitability of the livestock industries in this region. Rail transportation plays a big role in the movement of grains to the Southeast region. In 2023, rail accounted for 66 percent of cereal grains and animal feeds (by volume) shipped from outside the Southeast to the region, while trucks carried the remaining 34 percent (Freight Analysis Framework, 2024). Specifically, shipments to Georgia relied even more heavily on rail, with 91 percent of feed grain transported by rail during that year.

Results

This section outlines three components for estimating feed needs in Georgia and the Southeast from 2006 to 2022, including an analysis of the modal shares of select feed shipments to Georgia.

Animal units in Georgia

Using USDA-NASS data and the approach of Prater, O'Neil, and Sparger (2013), we calculate Georgia's animal units for cattle, dairy, sheep, poultry, turkey, and hog populations. Tables 1 and 2 present Grain Consuming Animal Units (GCAU) and High-Protein Animal Units (HPAU) estimates for Georgia and the Southeast. These animal units create a standardized measure to be able to aggregate across multiple livestock, dairy, and poultry species. Table 1 shows that Georgia's GCAUs have consistently hovered around 3.5, while the Southeast peaked in 2008 before declining until 2014. Similarly, table 2 indicates Georgia's HPAUs peaked in 2008, declined until 2015, and then stabilized from 2016 to 2019 before falling again through 2022. A comparable pattern is observed for HPAUs across the Southeast.

Table 1. Grain Consuming Animal Units (Millions), 2006-2022

Year	Georgia	Southeast Total
2006	3.5	23.7
2007	3.6	23.8
2008	3.6	24.1
2009	3.5	23.1
2010	3.4	22.4
2011	3.5	22.2
2012	3.5	21.9
2013	3.5	21.8
2014	3.5	21.4
2015	3.5	21.8
2016	3.6	22.4
2017	3.6	22.7
2018	3.6	22.9
2019	3.6	23.2
2020	3.6	23.1
2021	3.5	22.7
2022	3.5	22.4

Source: USDA-ERS (2024), USDA-NASS (2024), and Authors' Calculations

Table 2. High Protein Animal Units (Millions), 2006-2022

Year	Georgia	Southeast Total
2006	9.2	56.4
2007	9.5	56.6
2008	9.6	57.4
2009	9.2	54.9
2010	9.0	53.8
2011	9.3	53.7
2012	9.3	53.0
2013	9.2	52.7
2014	9.2	52.0
2015	9.3	52.8
2016	9.6	54.2
2017	9.5	54.8
2018	9.6	55.6
2019	9.6	56.3
2020	9.4	56.1
2021	9.2	55.2
2022	9.2	54.6

Source: USDA-ERS (2024), USDA-NASS (2024), and Authors' Calculations

Corn and soybean meal feed needs and "imports"

Corn feed needs in Georgia are calculated by multiplying national-level corn usage per GCAU (HPAU) by the number of GCAUs (HPAUs) in Georgia. "Imports" are estimated by subtracting corn and soybean-meal-equivalent production from the calculated feed needs for each.[1] Tables 3 and 4 summarize the corn and soybean meal feed needs for Georgia and the Southeast from 2006 to 2022. Both commodities show similar trends, with feed needs peaking early in the dataset, dipping in the mid-2010s, and rising again toward the end of the time frame. However, specific differences emerge: corn feed needs in Georgia and the Southeast hit a secondary peak in 2020, which was lower than the initial peaks during 2006-2008, as shown in table 3. In contrast, soybean meal feed needs in Georgia trended upward consistently, peaking in 2018 and remaining elevated through 2022, as depicted in table 4.

Table 3. Corn Needs for Feed (Million MT) in Georgia and the Southeastern Region, 2006-2022

Year	Georgia	Southeast Total
2006	6.0	40.3
2007	5.5	36.0
2008	5.7	37.7
2009	4.9	32.4
2010	4.8	31.7
2011	4.6	29.1
2012	4.3	26.9
2013	4.1	25.9
2014	4.9	30.1
2015	5.1	31.7
2016	5.0	30.9
2017	5.2	32.8
2018	4.9	31.3
2019	4.9	31.5
2020	5.1	33.3
2021	5.0	32.3
2022	5.0	32.2

Source: USDA-ERS (2024), USDA-NASS (2024), and Authors' Calculations

[1] Since soybean meal production is not reported, we convert soybean production into soybean meal equivalents, with around 79% of soybean being processed into soybean meal (U.S. Soybean Export Council, 2024).

Table 4. Soybean Meal Needs for Feed (Million MT) in Georgia and the Southeastern Region, 2006-2022

Year	Georgia	Southeast Total
2006	2.0	12.0
2007	2.1	12.3
2008	2.0	11.8
2009	1.8	10.7
2010	1.7	10.6
2011	1.7	10.4
2012	1.7	10.7
2013	1.5	9.8
2014	1.6	9.9
2015	1.7	10.8
2016	1.7	11.1
2017	1.8	11.1
2018	2.0	11.8
2019	2.0	12.0
2020	2.0	12.4
2021	2.0	12.2
2022	2.0	12.6

Source: USDA-ERS (2024), USDA-NASS (2024), and Authors' Calculations

Table 5 outlines the additional corn and soybean meal needed in Georgia to feed its livestock and poultry. The table shows that feed needs above production slid lower from 2006 to the mid-2010s, driven partly by reductions in feed requirements (see table 3) but mainly by increased corn and soybean meal-equivalent production. Between 2006 and 2015, Georgia's corn production rose by over 80 percent, while soybean-meal-equivalent increased by approximately 200 percent. Since the mid-2010s, the corn and soybean meal feed needs above production have diverged. Both bounced up from lows set in the mid-2010s. Corn feed needs above production remained elevated until 2018, followed by a sharper decline beginning in 2021. In contrast, soybean meal feed needs above production showed an upward trend through 2022.

At the bottom of the table, two five-year averages were calculated: one for 2006-2010 and another for 2018-2020. The percentage changes between these averages are also presented. The results reveal that corn feed needs above production declined by around 20 percent, while

soybean meal feed needs above production increased by 14 percent over this period. These trends suggest that Georgia is becoming more dependent on soybean meal imports to meet the expanding feed requirements of its livestock and poultry industries.

Table 5. Georgia Corn and Soybean Meal Feed Needs Above Production

Year	Corn (Billion Bu)	Soybean Meal (Million MT)
2006	5.2	1.9
2007	4.8	2.0
2008	4.2	1.8
2009	3.8	1.5
2010	3.5	1.4
2011	3.7	1.7
2012	3.2	1.8
2013	2.7	1.5
2014	2.8	1.5
2015	3.8	1.6
2016	3.8	1.7
2017	3.8	1.8
2018	3.8	1.9
2019	3.6	1.9
2020	3.7	2.0
2021	3.2	2.0
2022	3.0	2.0
2006-2010 Average	4.3	1.7
2018-2022 Average	3.5	2.0
Percent Change	-19.5%	14.0%

Source: USDA-ERS (2024), USDA-NASS (2024), and Author Calculations

Modal Shares of Grain Shipments

Modal shares represent the proportion of total grain movements carried by a specific transportation mode. For grains destined for domestic markets—primarily feed—the dominant modes are rail and truck (Henderson, Gastelle, and Caffarelli, 2023). While these modal shares are readily available at the national level, equivalent data for state-level shipments are not directly accessible. However, state-level modal shares can be approximated using a combination of state-

specific usage data (e.g., feed needs and exports) and shipment records from confidential rail and barge datasets.

Tables 6, 7, and 8 present average rail, barge, and truck modal shares for corn and soybean meal equivalent shipments into Georgia and the Southeast from 2009 to 2020. These tables include overall averages (2009-2020), two five-year averages (2009-2013 and 2016-2020), and the percentage-point change between these periods. Rail accounted for over 70 percent of Georgia's shipments, surpassing 90 percent for soybean meal equivalents, while barge shares stayed below 1 percent throughout the period. Georgia's reliance on rail for importing corn and soybean meal equivalent is greater than that of the broader Southeast. In contrast, the Southeast's barge modal shares for corn exceeded 10 percent, while soybean meal equivalent shipments by barge was over 30 percent. This reflects reliance on barge transport in states like Arkansas, Maryland, Mississippi, and Tennessee to move grains to southern and eastern ports for export.

Table 8 shows that truck modal shares for soybean meal equivalent in Georgia and the Southeast were roughly 20 percentage points lower than for corn between 2009 and 2020. This suggests that soybean meal is more frequently transported by rail or barge than corn. Georgia's rail share for corn declined by 10 percentage points from 2009-2013 to 2016-2020, with truck shares increasing correspondingly—a trend mirrored in the Southeast. However, modal shares for soybean meal equivalent in Georgia remained stable across the two periods.

Table 6. Rail Modal Shares in Georgia and the Southeast

Average	Corn		Soybean Meal	
	Georgia	***Southeast Total***	***Georgia***	***Southeast Total***
2009-2020	73.4%	48.7%	94.0%	49.9%
2009-2013	77.9%	53.9%	94.0%	53.7%
2016-2020	67.9%	44.4%	93.4%	46.7%
5-year Averages PP Change	-10.0	-9.6	-0.7	-7.0

Note: PP = percentage point.
Source: RFA (2024), U.S. ACE (2024), U.S. BTS (2024), Handerson, Gastelle, and Caffarelli (2024), USDA-ERS (2024), USDA-FAS (2024), USDA-NASS (2024b;c), U.S. STB (2024), and Authors' Calculations.

Table 7. Barge Modal Shares in Georgia and the Southeast

Average	Corn		Soybean Meal	
	Georgia	*Southeast Total*	*Georgia*	*Southeast Total*
2009-2020	0.1%	10.6%	0.1%	31.2%
2009-2013	0.3%	11.2%	0.1%	27.5%
2016-2020	0.0%	9.3%	0.1%	32.7%
5-year Averages PP Change	-0.3	-1.9	0.1	5.2

Source: RFA (2024), U.S. ACE (2024), U.S. BTS (2024), Handerson, Gastelle, and Caffarelli (2024), USDA-ERS (2024), USDA-FAS (2024), USDA-NASS (2024b;c), U.S. STB (2024), and Authors' Calculations.

Table 8. Truck Modal Shares in Georgia and the Southeast

Average	Corn		Soybean Meal	
	Georgia	*Southeast Total*	*Georgia*	*Southeast Total*
2009-2020	26.5%	40.7%	6.0%	19.0%
2009-2013	21.8%	34.8%	5.9%	18.8%
2016-2020	32.0%	46.3%	6.5%	20.6%
5-year Averages PP Change	10.2	11.4	0.6	1.7

Source: RFA (2024), U.S. ACE (2024), U.S. BTS (2024), Handerson, Gastelle, and Caffarelli (2024), USDA-ERS (2024), USDA-FAS (2024), USDA-NASS (2024b;c), U.S. STB (2024), and Authors' Calculations.

Conclusions

Georgia is the nation's leading broiler producer and is a significant deficit grain area. Thus, securing field crops for animal feed from outside the state is critical. This study identifies feed needs between 2006 and 2022 for Georgia and the entire Southeast. The results indicate that Georgias's corn feed needs have varied considerably over time, whereas soybean meal-equivalent have shown more stability. These trends are mainly driven by substantial increases in corn production in Georgia, which have reduced the state's reliance on corn "imports" from outside the region.

Estimates of modal shares for corn and soybean meal equivalent movements reveal the prominent role of rail transportation in delivering field crops to the region. Trucks have also become increasingly important for moving corn into Georgia. Consequently, disruptions in railroads and trucks caused by weather events, labor strikes, or other shocks can be significant risks for stakeholders along the supply chain, including livestock producers, agricultural

commodity producers, grain shippers, terminal and country elevators, and feed manufacturing firms. Furthermore, fluctuations in fuel prices for both rail and truck modes can significantly affect the livestock and poultry industries, given the inelastic nature of transportation demand in the Southeast (Jo and Secor, 2024b).

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