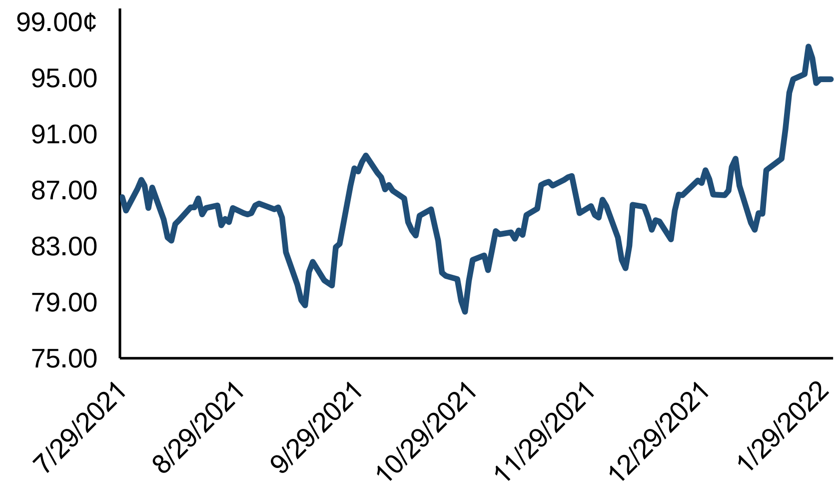
The Asset Management Group

Pennsylvania State University

LHJ2 | Six-Month Price Chart



Position Details

- Lean Hog | LHJ2
- Underlying Price: 97.65¢
- Long Butterfly Spread with Puts
- Expiration Date: April 14, 2022

Agriculture Sector

Associate
Noah Miller
Noahbmiller10@gmail.com

Analyst
Arianna Anderson
Arifaithanderson@gmail.com

Analyst
Gavin Carey
Gavin.Carey22@gmail.com

President
Luke Palma
lukepalma25@gmail.com

Vice President
Nico Mahramas
nicomahramas@gmail.com

Chief Investment Officer
Joseph Palermo
joseph.palermo12@gmail.com

Table of Contents

I. Product & Position Overview

Product & Position Overview

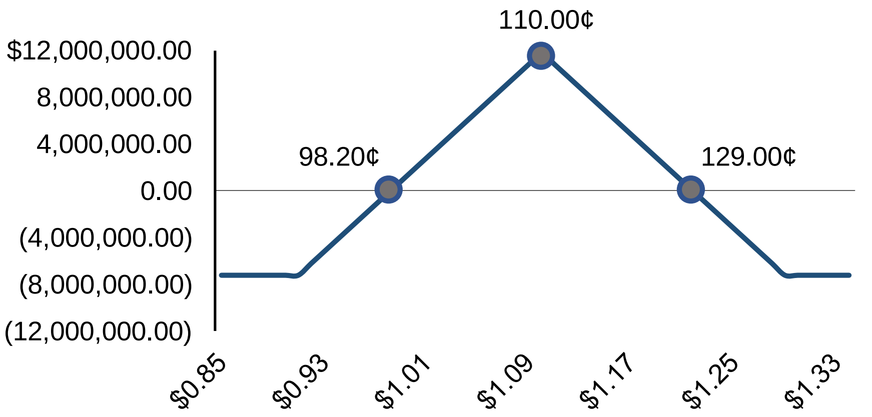
Product Description

- Lean hog is a type of hog (pork) futures contract that can be used to hedge and to speculate on future prices of pork
- Standard lean hog contracts represent 40.00 k pounds of meat with a trading limit of 4.75¢ per pound per day
  - The average hog weighs between 260.00 and 290.00 pounds at slaughter and yields a carcass weighing between 190.00 and 211.00 pounds
- **Major Countries Involved**
  - Imports
    - China | 31.40%
    - Japan | 11.80%
    - Italy | 5.50%
  - Exports
    - Spain | 17.40%
    - U.S. | 16.10%
    - Germany | 12.80%

Trade Breakdown

- **Long Butterfly Spread with Puts**
  - The strategy is bullish as the underlying approaches the middle strike
- **Setup**
  - We Buy – 2.50 k OTM 91.00¢ Puts | LHJ2
  - We Sell – 5.00 k ITM 110.00¢ Puts | LHJ2
  - We Buy – 2.50 k ITM 129.00¢ Puts | LHJ2
- **Expiration**
  - Date: April 14, 2022

Payoff Diagram



Exit Strategy & Potential Hedge Strategy

- **Bull Base & Bear Case**
  - **110.00¢** / **103.00¢** / **91.00¢ & 129.00¢**
  - Breakeven – 98.20¢ & 121.80¢
- **Methodology**
  - The price target would represent about ~ 15.00% increase in the underlying
- **Hedge Strategy**
  - In the event of bearish movement, the Sector would sell corn futures through Sector briefings

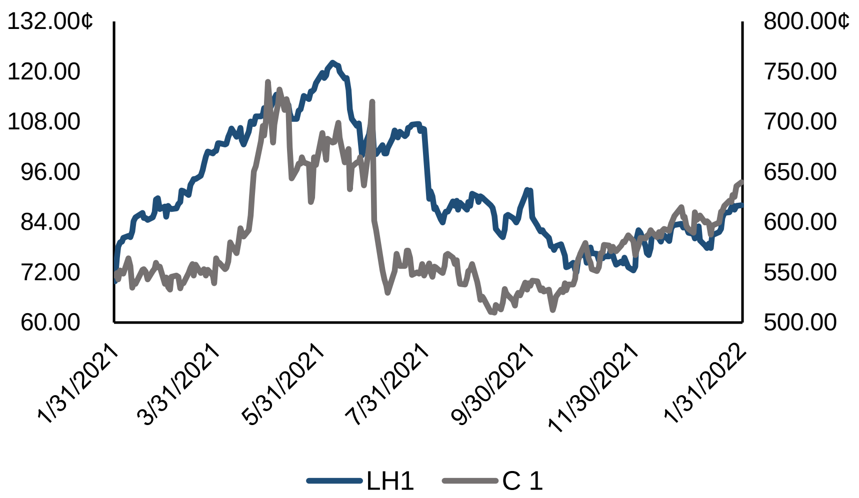
II. Macroeconomic Thesis

Macroeconomic Thesis

Macroeconomic Summary

- **President Biden's Plan to Increase Meatpacking Competition**
  - Recent administrative change has led to a call for more humane harvesting practice
  - Increased competition in the meatpacking industry will incentivize new suppliers to enter the market
  - The administration's policy would provide producers with higher profits and volatility in markets would decrease
- **Premature Lean Hog Slaughter**
  - Hog feed prices are heavily dependent on the price of corn to determine a manageable supply of lean hog
    - Corn is the most effective feed for developing lean hogs with prominent meat yields post slaughter
  - High feed prices are causing premature slaughter of lean hog prior to desired market weight of over 260.00 pounds
  - An estimated 35.00 k healthy pigs have been slaughtered due to slaughterhouse staff shortages
- **Labor Shortages in Slaughterhouses**
  - Domestic supply continues to be a concern as slaughterhouses fail to find sufficient labor
    - The COVID-19 Omicron variant is rapidly spreading and forcing slaughterhouses to reduce supply due to labor shortages in operations
    - The meatpacking industry is currently running between 6.00% to 10.00% behind production y/y
  - Consumers turn to smaller independent companies to satisfy their demand for pork

Lean Hog vs. Corn Front Month Contract | One-Year Chart



Market Pros & Cons

- Seasonally supplies of hog get tighter during this time of the year
- Resurgence of African swine fever in Europe and Eastern Asia
- Appreciation of U.S. dollar decreasing export demand
- Recovery from COVID-19 slowdowns and boosted slaughter

Bloomberg, Successful Farming

III. Risk Analysis

Risk Analysis

Directional & Magnitude Risk

- **Delta Analysis**
  - The trade has a Delta value of 0.4155
  - The trade benefits from bullish movement of the underlying as it approaches the strike at 110.00¢
- **Gamma Analysis**
  - The trade has a Gamma value of (0.0148)
  - Low market speed helps this trade as it allows for a slower approach towards our max profit
  - The Sector wants the underlying to increase incrementally as extreme movement would limit profit

Time Risk

- **Theta Analysis**
  - The trade has a Theta value of 0.0002
  - The position is net positive Theta as time erosion benefits the position if the underlying price remains between the two long strike prices

Implied Volatility Risk

- **Vega Analysis**
  - The trade has a Vega value of (0.0005)
  - The nature of this trade requires low volatility to allow our sector to capitalize at max profit
  - Bullish price movement along with low volatility would benefit the trade as it increases our chances of catching max profit

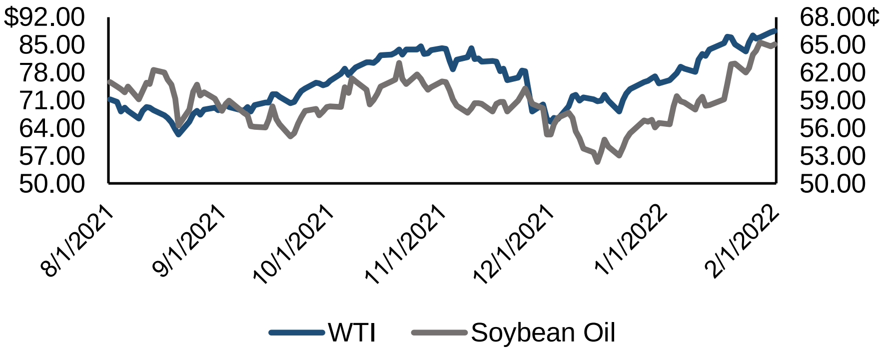
Interest Rate Risk

- **Rho Analysis**
  - The trade has a Rho value of (0.0001)
  - As interest rates increase the value of our position will decrease in value
  - The long positions of the strategy would decrease more relative to the increase in value of the short position

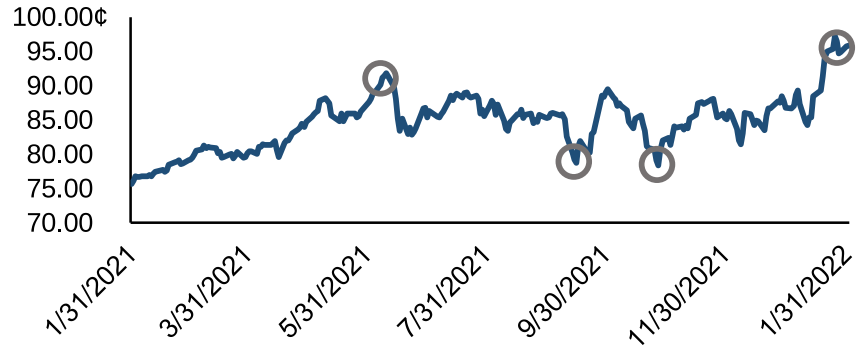
IV. Technical Bias & Fair Value

Technical Bias & Fair Value

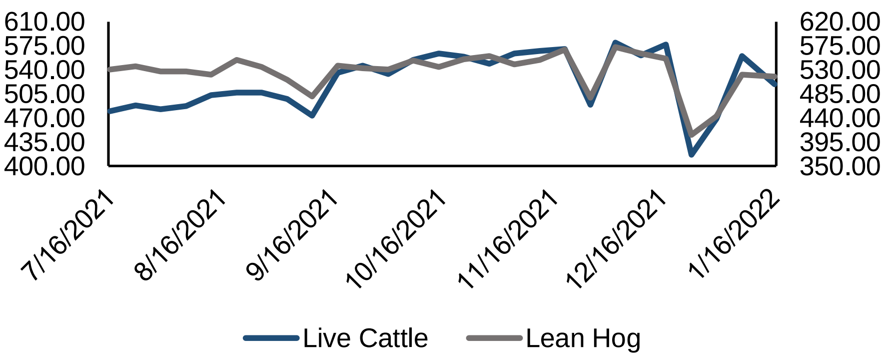
Soybean Oil vs. WTI Crude Oil | One-Year Chart



LHJ2 Major Events | One-Year Chart



Live Cattle vs. Lean Hog U.S. Weekly Slaughter | Six-Month Chart



Synopsis

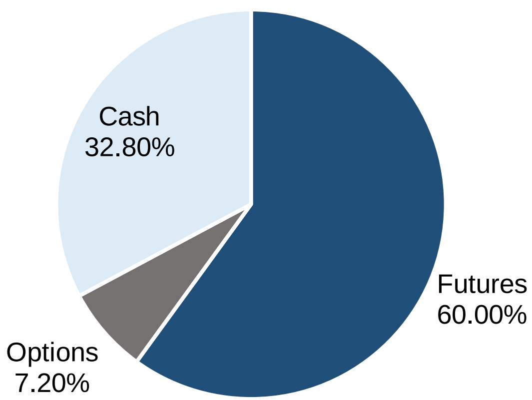
- Production of soybean oil used in biofuel doubled in 2019 y/y to 30.00%
  - 60.00-70.00% of U.S. vegetable oil is being used for biofuel research and production following President Biden's inauguration
- Global food import costs surged 12.00% following higher feed costs and supply chain challenges
  - The total number of slaughter fell 3.90% y/y
- Tightened supply coupled with rising cost concerns as lowered slaughter caused a decline in meat packing labor force

V. Capital Allocation

Capital Allocation

Allocation Breakdown & Portfolio Implications

- The Sector is allocating ~7.00% of its total capital to this trade
    - This brings total capital use for options to 7.20%
- This trade will expose the Sector to lean hog futures as they are not a part of the Bloomberg Agriculture Subindex
- In the event of adverse price movement, the Sector could either reverse trade or eliminate these long futures positions



Portfolio vs. Benchmark Allocation Weights