

## 2019 “ShuWei Cup”IMCM

### Problem C: Analysis of the Pork Price Fluctuations in China

The rapid growth of pork prices in China in the past six months has attracted the attention of the government and that of a large number of residents. In less than 160 days, pork prices increased from 14.68 yuan/kg on May 28, 2019 to 40.11 yuan/kg on November 1, 2019 (<https://zhujia.zhuwang.cc/>). Fortunately, there appeared a certain downward trend recently. But we are not sure if pork prices have come under control, and if pork prices can return to the normal levels. Please use the mathematical modeling method to solve the following problems:

#### Part I: Analysis of the main influencing factors of pork price fluctuation

- A.** Analyze the common influencing factors of pork price fluctuations by using data in the past years.
- B.** Are the recent fluctuations in pork prices highly correlated with the common fluctuations in pork prices? If not, what are the main influencing factors?

#### Part II: Research on the fallback of the pork price

- A.** Pork farming usually has a certain periodicity. When the price of pork is high, can you propose a reasonable farming plan? (Note that you should not only take into account the region where pig farming is impossible and the reasonable use of remote area for pig farming so as to realize the fallback of pork price in a short term. )
- B.** Under the premise that pork farming cannot be completed in a short time, can you propose a reasonable procurement plan from other countries that can guarantee the relative stability of domestic pork prices?

#### Part III: Research on Optimal Supply and Storage Strategy of Pork

- A.** When the demand for pork in different regions is relatively stable (using the data on the website <https://zhujia.zhuwang.cc/>), can you propose the optimal farming plan for different time zones in different regions? (Note that long-distance transportation of pigs and pork is not recommended.)
- B.** To effectively respond to the peak demand for pork in a certain area, can you propose an effective storage strategy for pork to ensure the stability of pork prices?

Your submission should consist of:

- One-page Summary Sheet.
- Your solution of no more than 20 pages, for a maximum of 22 pages with your summary.
- Note: Reference list and any appendices do not count toward the 22-page limit and should appear after your completed solution.