# IDENTIFIKASI VARIABEL KETERSEDIAAN DAGING SAPI DI JAWA TENGAH DENGAN PENDEKATAN *SYSTEM DYNAMICS*

## INTISARI

Indra Wahyu Pratama
19/453074/PPT/01089

Sistem ketersediaan daging sapi di Jawa Tengah cukup kompleks dan terdiri dari berbagai variabel. Kompleksitas sistem perlu dipahami untuk menciptakan kebijakan yang efektif. Penelitian ini bertujuan untuk menganalisis variabel pengungkit dalam sistem ketersediaan daging sapi di jawa tengah, mengukur perilaku sistem ketersediaan daging sapi di Jawa Tengah; dan menentukan strategi peningkatan ketersediaan daging sapi berdasarkan simulasi skenario model. Penelitian ini menggunakan metode pemodelan *system dynamics* dan *Interpretive Structural Modeling* (ISM). Data yang digunakan yaitu primer dan data sekunder. Data primer didapatkan dari hasil wawancara personal menggunakan kuesioner terstruktur terhadap tujuh *stakeholder* yang dipilih dengan metode *judgmental sampling*. Data sekunder yang terdiri dari data populasi sapi potong, serta variabel yang mempengaruhi permintaan dan penawaran daging sapi di Jawa Tengah didapatkan dari berbagai referensi. Pemodelan diawali dengan analisis kebutuhan sistem melalui metode *Interpretive Structural Modeling* (ISM). Tahapan selanjutnya adalah membangun model *system dynamics*. *Software* komputer yang digunakan yaitu Powersim Studio 10 dan ISM-Professional 2.0. Validasi model dilakukan dengan menggunakan metode *Mean Absolute Persentage Error* (MAPE). Hasil penelitian menunjukkan bahwa variabel pengungkit pada sistem ketersediaan daging sapi di Jawa Tengah adalah kualitas dan kuantitas hijauan pakan ternak. Kontribusi produksi daging sapi regional pada tahun 2028 mencapai 71,09 persen, namun mengalami penurunan pada tahun 2040 menjadi 30,80 persen. Penurunan tersebut terjadi karena adanya daya tampung daerah terhadap populasi sapi potong. Simulasi skenario menunjukkan bahwa skenario peningkatan produktivitas hijauan dalam jangka panjang mampu mendorong peningkatan populasi sapi potong dan produksi daging sapi. Meskipun demikian, strategi lain seperti peningkatan performa reproduksi ternak dan stabilisasi harga daging sapi perlu diterapkan untuk mempercepat peningkatan produksi daging sapi di Jawa Tengah.

(Kata kunci: daging sapi, *interpretive structural modeling*, ketersediaan, *system dynamics*)

# IDENTIFICATION OF BEEF AVAILABILITY VARIABLES IN CENTRAL JAVA USING SYSTEM DYNAMICS APPROACH

## ABSTRACT

Indra Wahyu Pratama
19/453074/PPT/01089

The beef supply system in Central Java is quite complex and consists of various variables. The complexity of the system needs to be understood to create effective policies. This study aims to analyze the leverage variables in the beef availability system in Central Java, measure the behavior of the beef availability system in Central Java; and determine the strategy to increase beef availability based on the model scenario simulation. This research uses system dynamics modeling and Interpretive Structural Modeling (ISM) methods. The data used are primary and secondary data. Primary data were obtained from personal interviews using a structured questionnaire to seven stakeholders selected by the judgmental sampling method. Secondary data consisting of beef cattle population data, as well as variables that affect the demand and supply of beef in Central Java were obtained from various references. The modeling begins with an analysis of system requirements through the Interpretive Structural Modeling (ISM) method. The next stage is to build a system dynamics model. The computer software used is Powersim Studio 10 and ISM-Professional 2.0. Model validation is done using the Mean Absolute Percentage Error (MAPE) method. The results showed that the lever variables in the beef supply system in Central Java were the quality and quantity of forage forage. The contribution of regional beef production in 2028 reached 71.09 percent but decreased in 2040 to 30.80 percent. The decrease was due to the regional capacity for beef cattle population. The scenario simulation shows that the scenario of increasing forage productivity in the long term can encourage an increase in beef cattle population and beef production. However, other strategies such as improving livestock reproductive performance and stabilizing beef prices need to be implemented to accelerate the increase in beef production in Central Java.

(Keywords: availability, beef, interpretive structural modeling, system dynamics)