



**UNIVERSITI PUTRA MALAYSIA**

**ANALYSIS OF PERFORMANCE OF BEEF SUB-SECTOR IN  
PENINSULAR MALAYSIA**

**ANAHITA HOSSEINI MATIN**

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**ANALYSIS OF PERFORMANCE OF BEEF SUB-SECTOR IN  
PENINSULAR MALAYSIA**

**By**

**ANAHITA HOSSEINI MATIN**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra  
Malaysia, in Fulfilment of the Requirements for the Degree of Master of  
Science**

**August 2009**



# *Dedication*

*To*

*My Father, Mother, and Brother*

*Heavenly Angels of my life*

*For their forever unconditional love, support,  
encouragement and patience through all these years of  
my life, no matter how wild I have acted or how huge I  
have made mistakes.*

*I am always proud to be your daughter.*



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in  
fulfilment of the requirement for the degree of Master of Science

**ANALYSIS OF PERFORMANCE OF BEEF SUB-SECTOR IN  
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**Chairman: Associate Professor Zainal Abidin Mohamed, PhD**

**Faculty : Agriculture**

Food production is not keeping pace with food demand. Growth in food production is consistently falling behind population growth making food shortages a recurrent problem. On the other hand, global financial crisis necessitates that world countries reach certain level of self-sufficiency in producing basic commodities. In Malaysia, the production of fresh beef is not enough to answer the people's need, either as food security reasons or to increase self-sufficiency level for the country. The major problem is that the beef sub sector of Malaysia has remained uncommercialized due to low productivity and the private sector has been silent on the beef sub sector development. The objectives of this study is to develop a Model for beef policy analysis in order to investigate the future trend of beef self sufficiency level in Malaysia via biological and mathematical simulation beef model, to



develop a beef production system modeling for policy analysis, to predict the beef supply trend in future plans, and to analyze the benefit/cost of implementing alternative policy in increasing beef production in Malaysia.

Vintage approach simulation matrix model (VASIMM) was used to analyze the objectives of the study. The VASIMM method uses aggregate data on bringing the new breeding stock into the model, reproduction of existing breeding stocks, and culling rate, to derive a theoretical slaughter system based on different rates of calving, replacement, mortality, and slaughter in the past, as reduction rates to system simulation, and simulate the final results of female breeding stocks, male breeding stocks, female calves, male calves, slaughter, and production of beef cattle, dairy cattle, and buffalo. The ex-post simulation analysis was applied for 1960-2006 period, and the model was validated using RMSE, RMSPE, and U-Theil inequality coefficient, as the base model of ex-ante simulation model. The ex-ante simulation analysis was developed by examining different policy variables, such as mortality, slaughter, and calving rate, importation of female breeding stocks, and importation of animal for slaughter, in 9 different Scenarios. Scenario 1 depicts the current situation of fresh beef production in Malaysia without any breeding stock importation. Scenario 2 assumes that all management variables (mortality rate, slaughter rate, etc) are the same as in Scenario 1, but there are 10,000 heads of female breeding stock importation. In Scenario 3, apart from the importation of female breeding stock, the management is also improved. Scenario 4 investigates the poor management system of the industry while Scenario 5 analyzes the effects of importing 10,000 heads of

beef cattle and buffalo for slaughter under the current situation. Scenarios 6, 7, and 8 are similar to Scenarios 2, 3, and 4 respectively, but the importation of beef cattle and buffalo for slaughter is added to each of them. Lastly, Scenario 9 investigates what changes in the current situation of fresh beef production would be if 50,000 heads of female breeding stock are imported in 2010, 2011, and 2012.

Amongst these 9 Scenarios, only Scenario 3 is economically applicable in long run, and can fulfill the targeted level of self-sufficiency (40%) by 2020. The results of positive Net Present Worth (NPW) and 45% level of self sufficiency under the following conditions of 3-4% mortality rate, 5-10% slaughter rate, 75-78% calving rate, importation of 10,000 heads Beef cattle, 500 heads Dairy cattle, and 500 heads Buffalo female breeding stock/year by 2010, respectively, indicate that under Scenario 3, in long run Malaysia can be independent on fresh beef importation. While, the negative value of NPW and low level of self sufficiency in Scenario 1, 2 , 4, 5, and 8 makes these Scenarios inapplicable. In Scenarios 6, 7 and 9, although the level of self sufficiency in beef production will be reached to the target and even exceed the target, the negative value of NPW depicts that Scenario 6, 7 and 9 are not economically feasible.

The simulated results indicate that Malaysia can boost its fresh beef production by increasing importation of female breeding stock, and improving the management system by reducing the rate of mortality and slaughter, and

increasing the rate of calving, so that Malaysia would be independent on beef production in the near future.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia  
sebagai memenuhi keperluan untuk ijazah Master Sains

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MALAYSIA**

Oleh

**ANAHITA HOSSEINI MATIN**

**Ogos 2009**

**Pengerusi: Profesor Madya Zainal Abidin Mohamed, PhD**

**Fakultie: Pertanian**

Pengeluaran makanan sentiasa tidak dapat memenuhi tahap permintaan terhadapnya. Pertumbuhan dalam pengeluaran makanan selama ini masih jauh lebih rendah berbanding pertumbuhan penduduk menjadikan isu kekurangan makanan suatu masalah berlanjutan. Krisis kewangan global pula memaksa negara-negara di dunia memiliki suatu tahap sara diri tertentu bagi komoditi-komoditi asas yang dikeluarkan. Di Malaysia, pengeluaran daging lembu segar masih lagi tidak mencukupi bagi menampung keperluan penduduk. Tahap sara diri komoditi ini adalah rendah memandangkan industri daging lembu negara tidak dijalankan secara komersil. Terdapat dua faktor yang menyumbang kepada masalah ini iaitu daya produktiviti yang rendah dan kurangnya penglibatan sektor swasta dalam aktiviti pembangunannya. Tujuan utama kajian ini dilakukan adalah bagi membentuk satu model analisa dasar daging lembu yang membolehkan tahap sara diri komoditi ini pada masa hadapan dapat dibuat melalui kaedah





simulasi matematik dan biologi. Selain itu, kajian ini dibuat untuk membina satu model sistem pengeluaran daging lembu, membuat unjuran corak bekalan daging lembu pada masa hadapan, serta membuat analisa kos dan faedah bagi suatu polisi alternatif baru bertujuan meningkatkan pengeluaran daging lembu.

Dalam kajian ini, model yang dikenali dengan nama *Vintage Approach Simulation Matrix* (VASIMM) digunakan. Model ini membolehkan semua data tentang stok baka baru, pembiakan stok baka sedia ada, dan kadar *culling* dikumpulkan untuk menghasilkan satu sistem penyembelihan teoritikal dengan mengambil kira kadar kelahiran anak-anak lembu, kadar penggantian, kadar kematian, dan kadar penyembelihan pada masa lalu. Analisa simulasi *ex-post* bagi tempoh 1960 hingga 2006 dilakukan dan model ini disahkan melalui kaedah *RMSE*, *RMSPE*, dan *U-Theil Inequality Coefficient* sebagai model asas bagi model simulasi *ex-ante*. Analisa simulasi *ex-ante* diperkembangkan dengan pelbagai pembolehubah seperti kadar kematian, penyembelihan, dan kelahiran anak lembu, jumlah stok baka lembu betina yang diimport, dan jumlah lembu import untuk disembelih bagi sembilan situasi berlainan (Scenario 1 hingga 9).

Senario 1 menunjukkan keadaan semasa bagi pengeluaran daging lembu segar di Malaysia dengan tiada sebarang import stok pembiakan dilakukan. Senario 2 membuat andaian bahawa semua pembolehubah pengurusan (kadar kematian, kadar penyembelihan dan lain-lain) adalah sama seperti Senario 1, tetapi terdapat import stok baka lembu betina sebanyak 10,000

ekor. Dalam Senario 3, selain daripada import stok baka lembu betina, tahap pengurusan juga dipertingkatkan. Senario 4 menyelidiki keadaan pengurusan yang lemah bagi industri ini manakala Senario 5 pula mengkaji kesan pengimportan 10,000 ekor lembu dan kerbau bagi tujuan penyembelihan dalam keadaan sekarang. Senario 6, 7, dan 8 adalah sama seperti Senario 2, 3, dan 4 masing-masing tetapi terdapat import lembu dan kerbau yang dibuat bagi setiap satunya. Akhir sekali, Senario 9 menyiasat perubahan yang akan berlaku terhadap industri pengeluaran daging lembu segar sekiranya 50, 000 ekor baka lembu betina diimport pada tahun 2010, 2011, dan 2012.

Antara kesemua sembilan situasi ini, didapati hanya Scenario 3 dapat digunakan dalam jangka masa panjang dan mampu mencapai tahap sara diri yang disasarkan pada tahun 2020 iaitu 40%. Nilai Semasa Bersih (*NPW*) *NPW* bagi Scenario 3 adalah positif dan tahap sara diri yang dicapai adalah 45%. Keadaan-keadaan yang terlibat bagi Scenario 3 adalah: kadar kematian (3-4%), kadar penyembelihan (5-10%), kadar kelahiran anak lembu (75-78%), bilangan baka lembu pedaging import setahun (10,000 ekor), bilangan baka lembu tenusu import setahun (500 ekor), dan bilangan baka kerbau *FBS* setahun (500 ekor). Keputusan yang dicapai ini membolehkan negara Malaysia tidak lagi perlu bergantung pada daging lembu import segar dalam jangka masa panjang. Lima lagi situasi (Scenario 1, 2, 4, 5, dan 8) tidak dapat diterima kerana kesemuanya menghasilkan nilai *NPW* yang negatif dan tahap sara diri yang rendah. Sementara itu, Scenario 6, 7 dan 9 pula menghasilkan tahap sara diri yang lebih tinggi daripada yang

disasarkan. Namun begitu, nilai NPW yang dicapai oleh kedua-duanya adalah negatif.

Berdasarkan pada keputusan-keputusan simulasi yang dibuat, negara Malaysia mampu meningkatkan pengeluaran daging lembu segar dengan menambahkan jumlah import stok baka lembu betina. Sistem pengurusan juga mesti diperbaiki bagi mengurangkan kadar kematian dan kadar penyembelihan lembu manakala kadar kelahiran anak lembu pula perlu ditingkatkan. Sekiranya semua ini dapat dicapai, negara Malaysia pasti mampu mengeluarkan daging lembu sendiri dengan secukupnya pada masa akan datang.

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I certify that an Examination Committee met on August 2009 to conduct the final examination of Anahita Hosseini Matin on her Master of Science thesis entitled “Analysis of Performance of Beef Sub-Sector in Peninsular Malaysia” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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Date: 16 October 2009





## DECLARATION

I hereby declare that this thesis is based on my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

*Anahita H. Matin*

**ANAHITA HOSSEINI MATIN**

Date: 16 October 2009



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