

Digestible lysine requirement of broilers:

Model evaluation and development of a Shiny online application in R



V. L. Daley
Postdoctoral Research Associate
National Animal Nutrition Program
Modeling Committee

V L Daley^{1,2}, M P Reis³, L V F M Carvalho⁴,
P Ferken⁴, N K Sakomura³ and M D Hanigan²

¹NANP, University of Kentucky

²Virginia Tech

³UNESP, Faculdade de Ciências Agrárias e Veterinárias,

⁴North Carolina State University, Raleigh, NC, USA.

UK University of
Kentucky

NC STATE UNIVERSITY
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DEPARTMENT OF
POULTRY SCIENCE

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“JÚLIO DE MESQUITA FILHO”

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LIFE SCIENCES
VIRGINIA TECH

Introduction

- Prediction models can be used for simulations to support decision-making.
- Interactive visualization figures and codes are important to increase data use for simulations.
- Interactivity is a key to science communication.

TOOLBOX
THE FUTURE OF SCIENTIFIC FIGURES

New tools for building interactive figures and software make scientific data more accessible, and reproducible.

ILLUSTRATION BY THEONNE KUTTNER

BY JEFFREY M. PERKEL

As Benjamin Delory started his paper documenting a new analysis pipeline to quantify plant morphology, he realized that one of the figures could pose a continuous and dynamic", says Delory, a post-doctoral researcher at Leuphana University of Lüneburg in Germany. "And the best solution to show something dynamic is to animate it." Scientific figures are typically rendered as static images. But these are divorced from the

The same is true for researchers working with computational algorithms. Scientists often post software on open-source repositories such as GitHub, but getting the code to run properly is easier said than done. Reviewers and other interested parties often require extra software

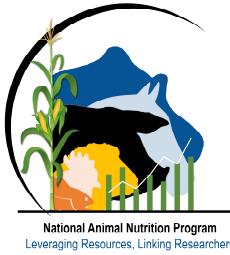
(Nature, Perkel, 2018).

National Animal Nutrition Program
Leveraging Resources, Linking Researchers



Objective

- 1) To evaluate the Lys requirement model for broilers.
- 2) To create an interactive web application for simulations.

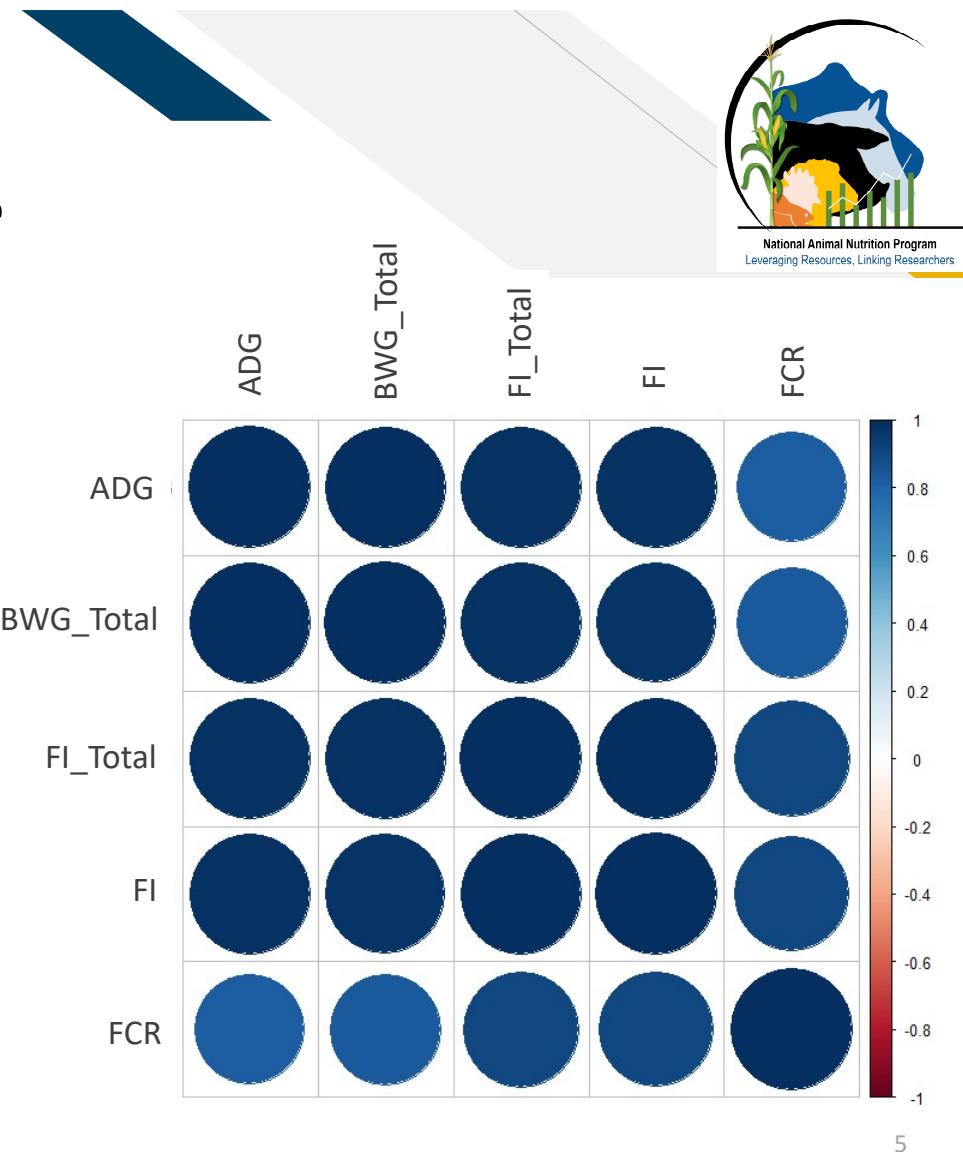
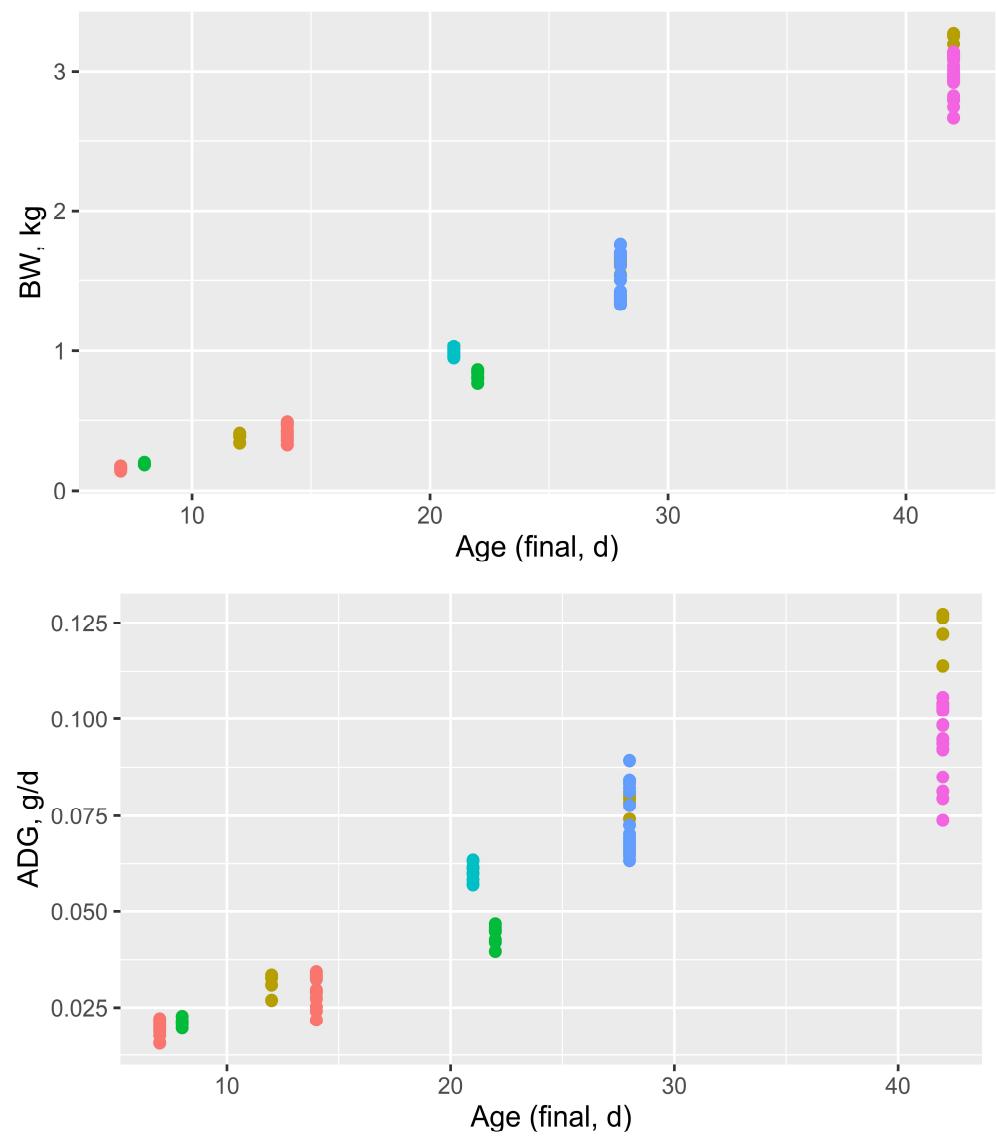


Material and methods

1. Model Evaluation:

Database

- Data from 6 independent studies (120 treatment means).
- Equation for estimating lysine (Lys) requirement for body weight gain (BWG) of broilers proposed by Sakomura et al. (2015).
- Data for line, sex, body weight (BW, kg), and BWG (g/d) were collected.





Material and methods

1. Model Evaluation:

- The equation evaluated was:

$$\text{Digestible Lys intake (mg/d)} =$$

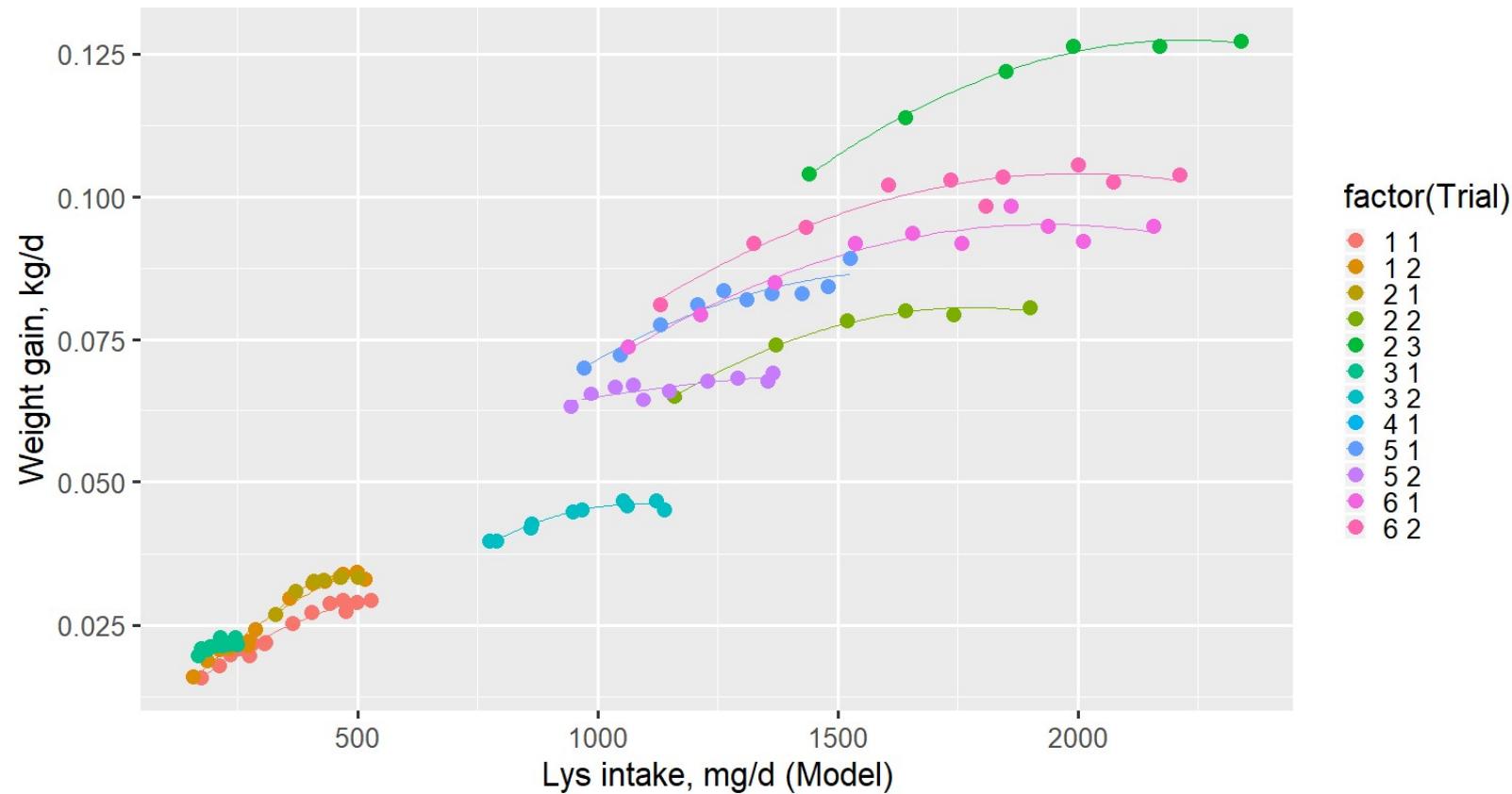
$$(45.1 \times \text{BW}^{0.75}) + [(- 23.14 + 13.39 \times \text{BWG}) / \text{LysEff}]$$

- Body weight (BW, kg) and BWG (g/d),
- The efficiency of digestible Lys utilization for growth (LysEff) was 0.77.
- Root mean square errors (RMSE), mean bias, slope bias, concordance correlation coefficient (CCC), and goodness of fit (R^2).



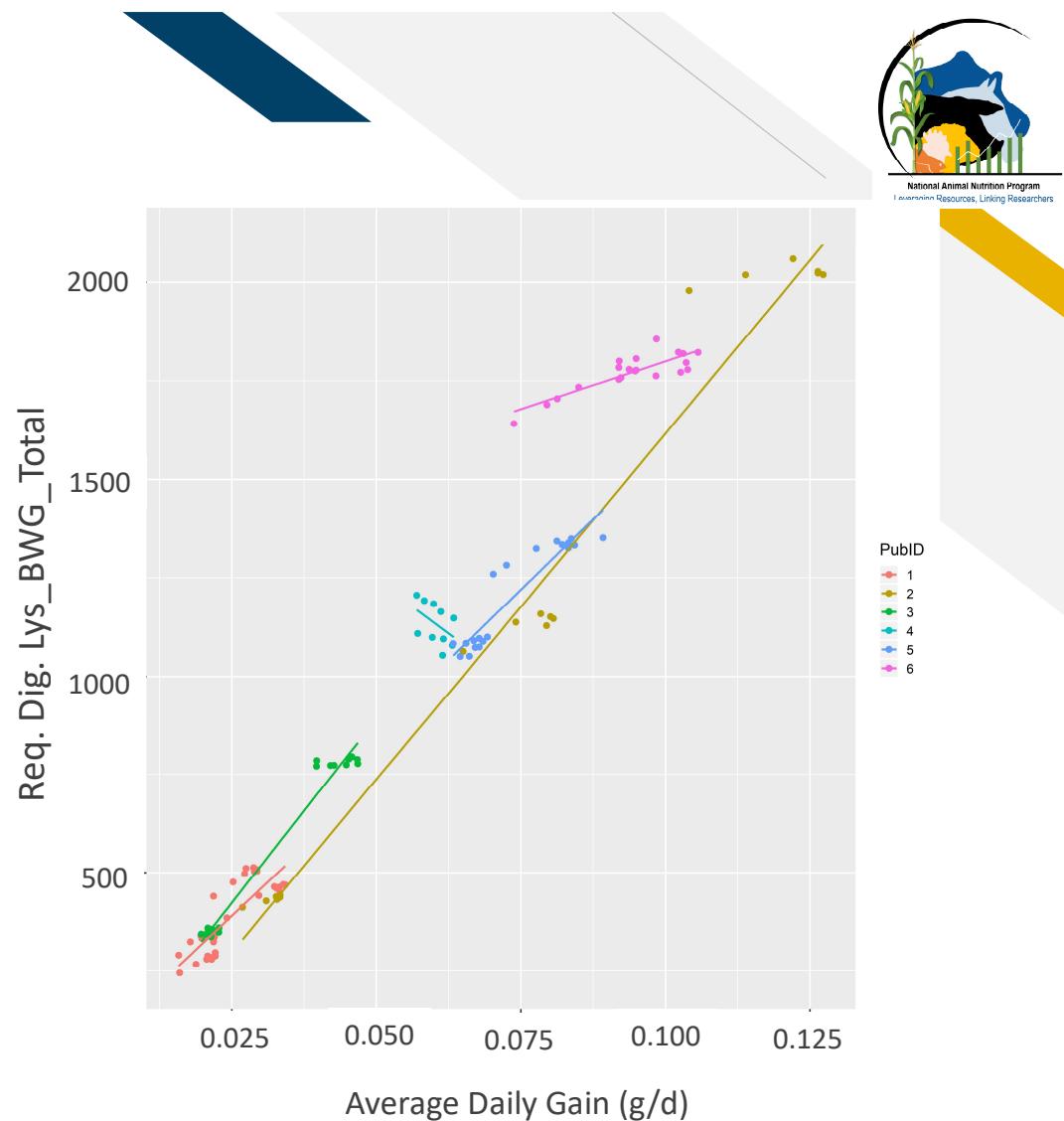
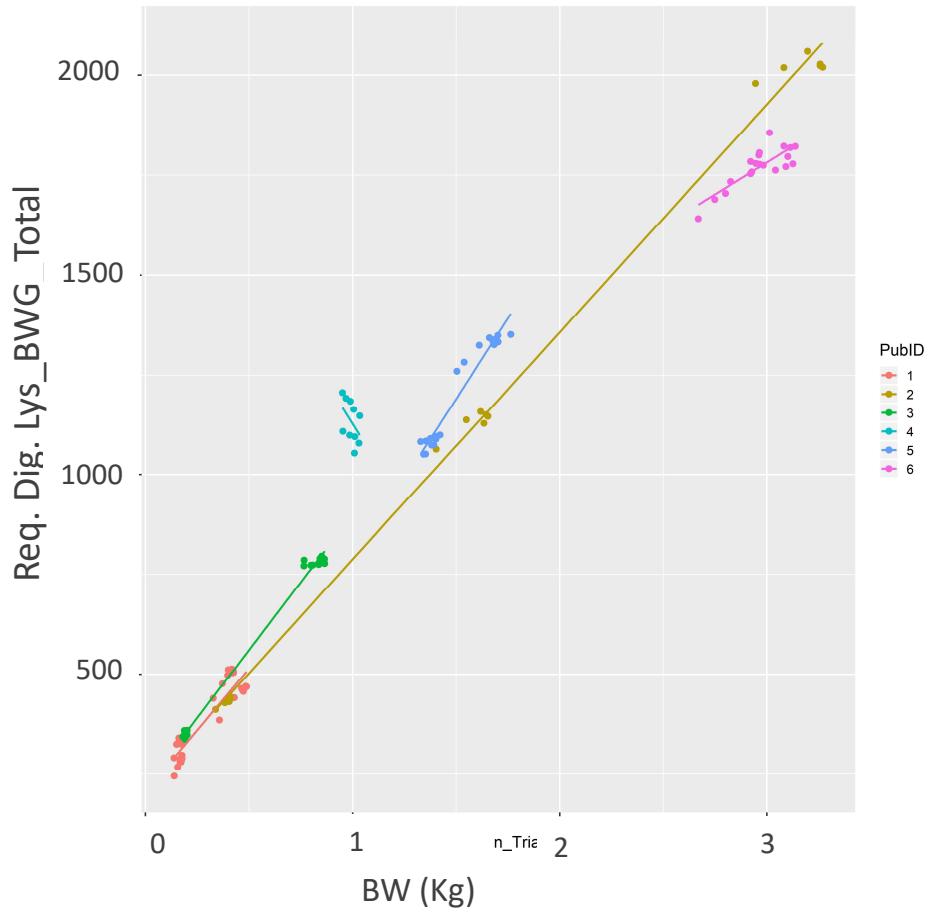
Results

Model Evaluation



Results

Model Evaluation





Results

Model Evaluation

N	120
Observed Req. Lys from studies (mg/d)	967
Predicted Req. Lys from the model (mg/d)	1002
RMSE	114
RMSE, % mean	12
Mean Bias, % MSE	9.28
Slope Bias, % MSE	1.89
Dispersion, % MSE	88.82
Mean Bias	-35
Slope Bias	-0.03
CCC	0.98
C _b	0.998
r	0.982

2. Development of an interactive Poultry Science web application

Framework

Material and methods

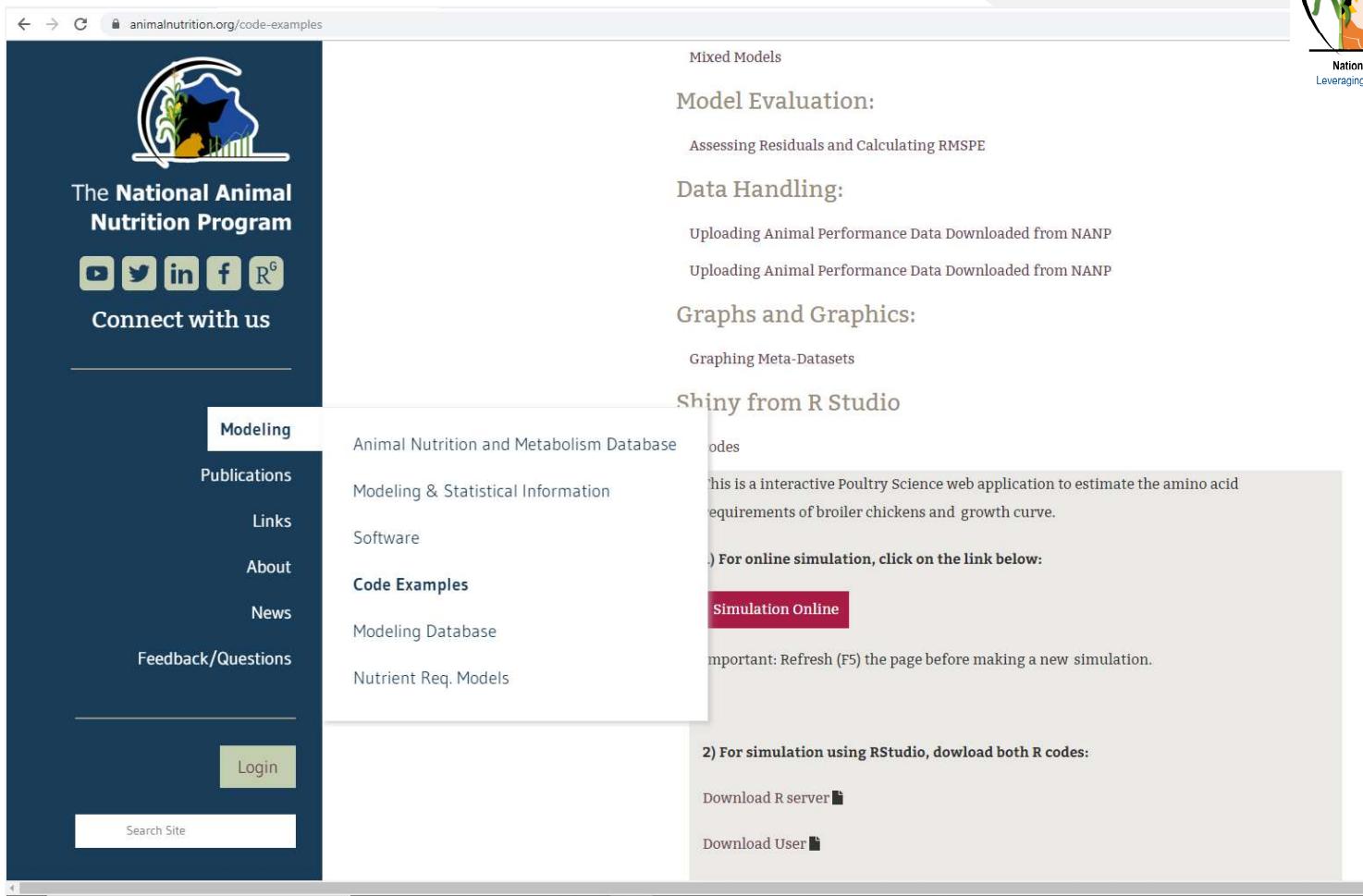
2. Development of an interactive Poultry Science web application framework



The screenshot shows the official Shiny website. At the top left, it says "Shiny from RStudio". The top navigation bar includes links for "Get Started", "Gallery", "Articles", "Reference", "Deploy", "Help", and "Contribute". A large blue banner on the right side contains the text "Interact. Analyze. Communicate." and "Take a fresh, interactive approach to telling your data story with Shiny. Let users interact with your data and your analysis. And do it all with R.". Below this banner, there's a large image of a map of the Great Lakes area with various data overlays, and a smaller inset image showing a scatter plot. A descriptive paragraph below the map states: "Shiny is an R package that makes it easy to build interactive web apps straight from R. You can host standalone apps on a webpage or embed them in R Markdown documents or". At the bottom right, there's a screenshot of the RStudio IDE interface, showing code and data in the editor and plots in the viewer pane.

Results

<https://animalnutrition.org/>



The screenshot shows the homepage of the National Animal Nutrition Program (<https://animalnutrition.org/>). The header features a logo of a pig and corn, with the text "National Animal Nutrition Program" and "Leveraging Resources, Linking Researchers". The main navigation menu includes links for Modeling, Publications, Links, About, News, Feedback/Questions, Login, and Search Site.

The "Modeling" menu item is currently selected, highlighted in white. The "Code Examples" section is expanded, showing sub-links: Mixed Models, Model Evaluation, Data Handling, Graphs and Graphics, and Shiny from R Studio.

The "Shiny from R Studio" section contains the following content:

- Animal Nutrition and Metabolism Database
- Modeling & Statistical Information
- Software
- Nutrient Req. Models

Below this, there is a callout box with the following text:

This is a interactive Poultry Science web application to estimate the amino acid requirements of broiler chickens and growth curve.

For online simulation, click on the link below:

Simulation Online

Important: Refresh (F5) the page before making a new simulation.

2) For simulation using RStudio, download both R codes:

[Download R server](#)

[Download User](#)



Material and methods

2. Development of an interactive Poultry Science web application framework

Shiny, rhandsontable,
DT, ggplot2, plotly, shinyjs



```
889
890
891 # 7 Growth curve
892
893 output$plot7 <- renderPlotly({
894   ggplot(values$df, aes(as.numeric(values$df$Age), as.numeric(values$df$BW_pred)))+
895     geom_point(color="green", size=1, show.legend=TRUE) +
896     geom_point(aes(y = values$df$BW_NRC), colour="blue", size=1) +
897     xlab("Age, d") + ylab("Body weight, kg") +
898     annotate("text", x= 20, y=4, label= "Estimate for the U.S. (blue)", size=4) +
899     annotate("text", x= 20, y=3.6, label= "Estimate for the Brazil (green)", size=4)
900   })
901
902
903
904 # US
905 output$plot7a <- renderPlotly({
906   ggplot(values$df, aes(as.numeric(values$df$Age), as.numeric(values$df$BW_NRC)))+
907     geom_bar(aes(fill = values$df$text8), stat="identity", position="dodge", show.legend=FALSE, size =
908     xlab("Age, d") + ylab("Body weight, kg") +
909     # geom_text(aes(label= round(values$df$Trp_EM, digits = 0)),position=position_dodge(width=0.9), vjust
910     theme(legend.position="bottom") + theme_set(theme_classic(base_size=13)) +
911     scale_x_continuous(breaks = values$df$Age) +
912     annotate("text", x= 20, y=3.6, label= "Estimate for the U.S.", size=4)
913   })
914
915 }
```

The R server code used equations for predicting the AA requirements of broiler chickens developed by Sakomura et al., 2015.

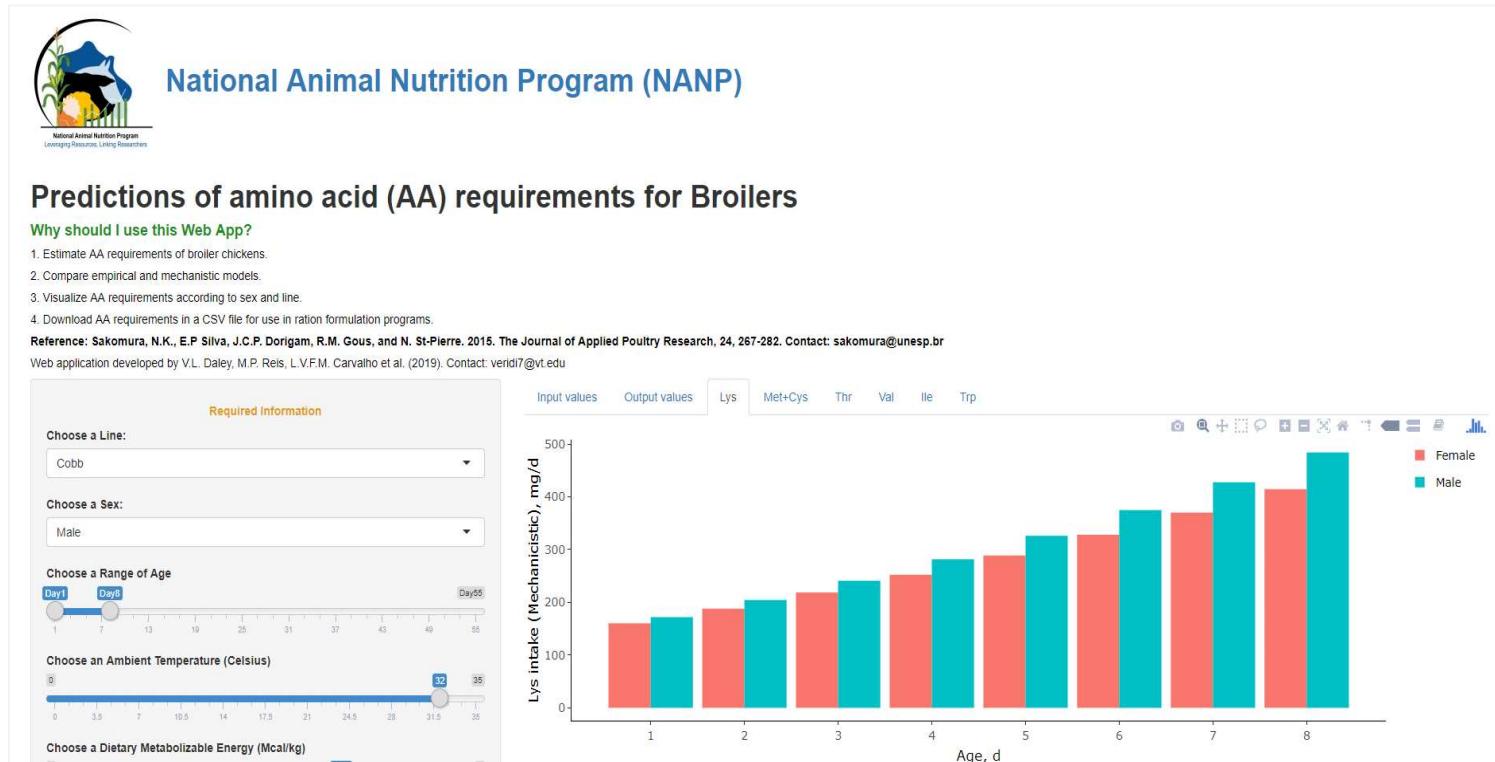
Two R scripts (user-interface and server, R Core Team 2018) control the layout, appearance, user-input, processing data, and model outputs.

```
1 # lessons https://shiny.rstudio.com/tutorial/written-tutorial/lesson6/
2 # https://cfss.uchicago.edu/shiny.html
3 # https://vvys.shinyapps.io/BirthdayApp/
4
5 library(shiny)
6 library(rhandsontable)
7 library(ggplot2)
8 library(plotly)
9 library(DT)
10 library(shinyjs)
11
12
13 jscode <- "shinyjs.refresh = function() { history.go(0); }"
14
15 title <- tags$a(
16   href = 'https://animalnutrition.org/',
17   tags$img(src="NANPlogo.png"), height = "0.5", width = "0.5",
18   strong("National Animal Nutrition Program (NANP)") ) #style = "color:blue"
19
20
21
22 shinyUI(fluidPage(
23
24   # Application title 1
25
26   )
27 )
```



Results

2. Development of an interactive Poultry Science web application framework



Interactive Poultry Science web application to estimate the amino acid requirements of broiler chickens.



National Animal Nutrition Program (NANP)

Predictions of amino acid (AA) requirements for Broilers

Why should I use this Web App?

1. Estimate AA requirements of broiler chickens.
 2. Compare empirical and mechanistic models.
 3. Visualize AA requirements according to sex and line.
 4. Download AA requirements in a CSV file for use in ration formulation programs.

Reference: Sakomura, N.K. et al., 2015. The Journal of Applied Poultry Research, 24, 267-282. Contact: sakomura@unesp.br

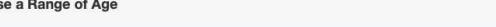
Web application developed by V.L. Daley, M.P. Reis, L.V.F.M. Carvalho et al. (2019). Contact: veridi7@vt.edu

Required Information

Choose a Line:
 ▼

Choose an USA Category:
 ▼

Choose a Sex:
 ▼

Choose a Range of Age

 A horizontal slider with numerical markers from 1 to 55 in increments of 7. Two specific points are highlighted with blue circles: 'Dev1' at the left end and 'Dev55' at the right end.

Choose an Ambient Temperature (Celsius)

 A horizontal slider with numerical markers from 0 to 35 in increments of 3.5. A blue circle highlights the value '32'.

Choose a Dietary Metabolizable Energy (Mcal/kg)

 A horizontal slider with numerical markers from 1 to 4 in increments of 0.1. A blue circle highlights the value '3.04'.

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Update Table Clear

Required Information

Choose a Line:

Ross

Ross
Cobb
Hubbard

Choose a Sex:

Male

Choose a Range of Age

Day1 Day55

Choose an Ambient Temperature (Celsius)

0 32 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

1 3.04 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Buttons:

Update Table Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
Show 14 entries								
	Age	Line	Sex					Temp
	No data							

Showing 0 to 0 of 0 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Range of Age
Day1 Day55

 A horizontal slider with tick marks at intervals of 7 days, ranging from Day 1 to Day 55. The slider is currently set between Day 31.5 and Day 35.

Choose an Ambient Temperature (Celsius)
0 35

 A horizontal slider with tick marks at 0, 3.5, 7, 10.5, 14, 17.5, 21, 24.5, 28, 31.5, and 35. The slider is currently set between 31.5 and 35.

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 4

 A horizontal slider with tick marks at 1, 1.3, 1.6, 1.9, 2.2, 2.5, 2.8, 3.1, 3.4, 3.7, and 4. The slider is currently set between 3.1 and 3.7.

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Required Information

Choose a Line:
Ross ▾

Choose an USA Category:
Late-developing ▾

Choose a Sex:
Male ▾
Female
Male

D 1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.7 4

Optional Information

Insert Body Weight (kg)
[Input Field]

Insert Feed Intake (g/day)
[Input Field]

Update Table **Clear**

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
Show 14 entries								
	Age	Line		Sex			Temp	
							No data	

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 to Day55

Choose an Ambient Temperature (Celsius)
0 to 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 to 4

Optional Information

Insert Body Weight (kg)
[Input field]

Insert Feed Intake (g/day)
15

Buttons: Update Table | Clear

Text at the bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
Show 14 entries								
	Age	Line	Sex					Temp
								No data

Showing 0 to 0 of 0 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 to Day55

Choose an Ambient Temperature (Celsius)
0 to 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 to 4

Optional Information

Insert Body Weight (kg)
[Empty input field]

Insert Feed Intake (g/day)
15

Buttons: Update Table, Clear

Text at the bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
Show 14 entries		Age	Line	Sex	Temp			
1	1	Ross	Male	32				

Showing 1 to 1 of 1 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day10 Day55

Choose an Ambient Temperature (Celsius)

 0 32 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
Show 14 entries		Age	Line	Sex	Temp			
1	1	Ross	Male	32				

Showing 1 to 1 of 1 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day10 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 26.4 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
15

Buttons
Update Table Clear

Text at the bottom
Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32

Showing 1 to 1 of 1 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day10 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 26.4 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)
[empty input field]

Insert Feed Intake (g/day)
44

Buttons: Update Table, Clear

Text at bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
Show 14 entries	Age	Line	Sex	Temp				
1	1	Ross	Male	32				

Showing 1 to 1 of 1 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day10 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 26.4 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
44

Buttons: Update Table, Clear

Text at bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4

Showing 1 to 2 of 2 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day11 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 26.4 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
44

Buttons
Update Table Clear

Text at the bottom
Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	1 Ross	Male	32
2	10 Ross	Male	26.4

Showing 1 to 2 of 2 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day11 Day55

Choose an Ambient Temperature (Celsius)

 0 26.1 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.1 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Buttons:

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4

Showing 1 to 2 of 2 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day11 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 26.1 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.1 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
49

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	1 Ross	Male	32
2	10 Ross	Male	26.4

Showing 1 to 2 of 2 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day11 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 26.1 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.1 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
49

Buttons
Update Table Clear

Text at the bottom
Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

	Age	Line	Sex	Temp
1	1	Ross	Male	32
2	10	Ross	Male	26.4
3	11	Ross	Male	26.1

Showing 1 to 3 of 3 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day24 Day55
 1 7 13 19 31 37 43 49 55

Choose an Ambient Temperature (Celsius)

 0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35
 26.1

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4
 3.1

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

	Age	Line	Sex	Temp
1	1	Ross	Male	32
2	10	Ross	Male	26.4
3	11	Ross	Male	26.1

Showing 1 to 3 of 3 entries

Required Information

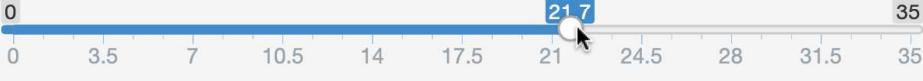
Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day24 Day55

Choose an Ambient Temperature (Celsius)

 0 21.7 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.1 4

Optional Information

Insert Body Weight (kg)
[Empty input field]

Insert Feed Intake (g/day)
49

Buttons:
Update Table Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

	Age	Line	Sex	Temp
1	1	Ross	Male	32
2	10	Ross	Male	26.4
3	11	Ross	Male	26.1

Showing 1 to 3 of 3 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day24 Day55
 1 7 13 19 31 37 43 49 55

Choose an Ambient Temperature (Celsius)

 0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35
 21.7

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4
 3.1

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

	Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth C
	Show 14 entries								
	Age	Line	Sex	Temp					
1	1	Ross	Male						32
2	10	Ross	Male						26.4
3	11	Ross	Male						26.1

Showing 1 to 3 of 3 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day24 Day55

Choose an Ambient Temperature (Celsius)

 0 21.7 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.1 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Update Table **Clear**

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

	Age	Line	Sex	Temp
1	1	Ross	Male	32
2	10	Ross	Male	26.4
3	11	Ross	Male	26.1
4	24	Ross	Male	21.7

Showing 1 to 4 of 4 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day25 Day55

Choose an Ambient Temperature (Celsius)

 0 21.7 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.1 4

Optional Information

Insert Body Weight (kg)
[Empty input field]

Insert Feed Intake (g/day)
124

Buttons: Update Table | Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

	Age	Line	Sex	Temp
1	1	Ross	Male	32
2	10	Ross	Male	26.4
3	11	Ross	Male	26.1
4	24	Ross	Male	21.7

Showing 1 to 4 of 4 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day25 Day55

Choose an Ambient Temperature (Celsius)

 0 21.4 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.1 4

Optional Information

Insert Body Weight (kg)
[Empty input field]

Insert Feed Intake (g/day)
124

Buttons: Update Table | Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7

Showing 1 to 4 of 4 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day25 Day55

Choose an Ambient Temperature (Celsius)

 0 21.4 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.2 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7

Showing 1 to 4 of 4 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day25 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 21.4 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
131

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	1 Ross	Male	32
2	10 Ross	Male	26.4
3	11 Ross	Male	26.1
4	24 Ross	Male	21.7

Showing 1 to 4 of 4 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day25 Day55
1 7 13 19 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 21.4 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
131

Buttons

Text at the bottom
Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4

Showing 1 to 5 of 5 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day39 Day55

Choose an Ambient Temperature (Celsius)
0 21.4 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
131

Buttons: Update Table | Clear

Text at bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4

Showing 1 to 5 of 5 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day39 Day55


Choose an Ambient Temperature (Celsius)
0 18.9 35


Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4


Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
131

Buttons
Update Table Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4

Showing 1 to 5 of 5 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day39 Day55


Choose an Ambient Temperature (Celsius)
0 18.9 35


Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4


Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
210

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4

Showing 1 to 5 of 5 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 31 Day55


Choose an Ambient Temperature (Celsius)
0 18.9 35


Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4


Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
210

Update Table **Clear**

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4
6	Ross	Male	18.9

Showing 1 to 6 of 6 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 31 Day40 43 Day55 55

Choose an Ambient Temperature (Celsius)
0 18.9 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
210

Buttons: Update Table | Clear

Text at bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4
6	Ross	Male	18.9

Showing 1 to 6 of 6 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age

 Day1 Day40 Day55

Choose an Ambient Temperature (Celsius)

 0 18.8 35

Choose a Dietary Metabolizable Energy (Mcal/kg)

 1 3.2 4

Optional Information

Insert Body Weight (kg)
[Empty input field]

Insert Feed Intake (g/day)
215

Buttons:

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4
6	Ross	Male	18.9
7	Ross	Male	18.8

Showing 1 to 7 of 7 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day49 Day55

Choose an Ambient Temperature (Celsius)
18.8

Choose a Dietary Metabolizable Energy (Mcal/kg)
3.2

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
215

Buttons: Update Table | Clear

Text at bottom: Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

Age	Line	Sex	Temp
1	Ross	Male	32
2	Ross	Male	26.4
3	Ross	Male	26.1
4	Ross	Male	21.7
5	Ross	Male	21.4
6	Ross	Male	18.9
7	Ross	Male	18.8

Showing 1 to 7 of 7 entries

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day49 Day55
1 7 13 19 25 31 37 43 49 55

Choose an Ambient Temperature (Celsius)
0 18.8 35
0 3.5 7 10.5 14 17.5 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 3.2 4
1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
244

Update Table **Clear**

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth C

Show 14 entries

	Age	Line	Sex	Temp
1	1	Ross	Male	32
2	10	Ross	Male	26.4
3	11	Ross	Male	26.1
4	24	Ross	Male	21.7
5	25	Ross	Male	21.4
6	39	Ross	Male	18.9
7	40	Ross	Male	18.8
8	49	Ross	Male	18.8

Showing 1 to 8 of 8 entries



National Animal Nutrition Program (NANP)

Predictions of amino acid (AA) requirements for Broilers

Why should I use this Web App?

1. Estimate AA requirements of broiler chickens.
2. Compare empirical and mechanistic models.
3. Visualize AA requirements according to sex and line.
4. Download AA requirements in a CSV file for use in ration formulation programs.

Reference: Sakomura, N.K. et al., 2015. The Journal of Applied Poultry Research, 24, 267-282. Contact: sakomura@unesp.br

Web application developed by V.L. Daley, M.P. Reis, L.V.F.M. Carvalho et al. (2019). Contact: veridi7@vt.edu

Required Information

Choose a Line: Ross

Choose an USA Category: Late-developing

Choose a Sex: Male

Choose a Range of Age

Day1 Day49 Day55

Choose an Ambient Temperature (Celsius)

18.8

Choose a Dietary Metabolizable Energy (Mcal/kg)

3.2

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

244

Update Table Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

	Age	Line	Sex	Temp	MEd	BW_actual	Intake_actual
1	1	Ross	Male	32	3		15
2	10	Ross	Male	26.4	3		44
3	11	Ross	Male	26.1	3.1		49
4	24	Ross	Male	21.7	3.1		124
5	25	Ross	Male	21.4	3.2		131
6	39	Ross	Male	18.9	3.2		210
7	40	Ross	Male	18.8	3.2		215
8	49	Ross	Male	18.8	3.2		244

Showing 1 to 8 of 8 entries

Previous 1 Next



National Animal Nutrition Program (NANP)

Predictions of amino acid (AA) requirements for Broilers

Why should I use this Web App?

1. Estimate AA requirements of broiler chickens.
2. Compare empirical and mechanistic models.
3. Visualize AA requirements according to sex and line.
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Reference: Sakomura, N.K. et al., 2015. The Journal of Applied Poultry Research, 24, 267-282. Contact: sakomura@unesp.br

Web application developed by V.L. Daley, M.P. Reis, L.V.F.M. Carvalho et al. (2019). Contact: veridi7@vt.edu

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 1 7 13 19 25 31 37 43 Day49 49 Day55 55

Choose an Ambient Temperature (Celsius)
0 0 3.5 7 10.5 14 17.5 18.8 21 24.5 28 31.5 35

Choose a Dietary Metabolizable Energy (Mcal/kg)
1 1 1.3 1.6 1.9 2.2 2.5 2.8 3.1 3.4 3.7 4

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
244

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

	Input values	Output values	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth Curve	ValRatio_EM	IsoRatio_EM	TrpRatio_EM	Lys_MM_FI	MetpCys_MM_FI	Thr_MM_FI	Val_MM_FI	Iso_MM_FI	Trp_MM_FI	Lys_EM_FI	MetpCys_EM_FI	Thr_EM_FI	Val_EM_FI	Iso_EM_FI	Trp_EM_FI	
1	72.68	60.54	20.30	0.96	0.70	0.68	0.80	0.70	0.17	1.10	0.68	0.82	0.80	0.66	0.22	0.92	0.98	1.02	0.83	0.26	0.92	0.98	1.02	0.83	0.26
2	75.74	61.20	19.57	1.08	0.75	0.74	0.87	0.77	0.19	1.35	0.92	0.98	1.02	0.82	0.26	0.92	0.98	1.02	0.83	0.26	0.92	0.98	1.02	0.83	0.26
3	75.87	61.23	19.55	1.07	0.74	0.74	0.87	0.76	0.19	1.34	0.92	0.97	1.02	0.82	0.26	0.92	0.97	1.02	0.82	0.26	0.92	0.97	1.02	0.82	0.26
4	76.84	61.41	19.40	1.04	0.69	0.70	0.83	0.73	0.18	1.28	0.90	0.92	0.92	0.89	0.25	0.90	0.92	0.92	0.89	0.25	0.90	0.92	0.92	0.89	0.25
5	76.90	61.42	19.40	1.03	0.68	0.69	0.82	0.72	0.18	1.26	0.88	0.90	0.97	0.87	0.24	0.88	0.90	0.97	0.87	0.24	0.88	0.90	0.97	0.87	0.24
6	77.89	61.57	19.38	0.89	0.58	0.59	0.70	0.62	0.15	1.05	0.73	0.75	0.75	0.64	0.20	0.73	0.75	0.75	0.64	0.20	0.73	0.75	0.75	0.64	0.20
7	77.98	61.58	19.38	0.88	0.57	0.58	0.69	0.61	0.15	1.03	0.72	0.73	0.73	0.63	0.20	0.72	0.73	0.73	0.63	0.20	0.72	0.73	0.73	0.63	0.20
8	78.93	61.71	19.39	0.77	0.49	0.51	0.61	0.53	0.13	0.88	0.62	0.63	0.70	0.54	0.17	0.62	0.63	0.70	0.54	0.17	0.62	0.63	0.70	0.54	0.17

Input values		Output values		Lys	Met+Cys	Thr	Val	Ile	Trp	Growth Curve													
		BW_pred	BW_NRC	BWG_pred	BPW	BPD	FPW	FPD	FW	FG	MEreq	FI_pred	Lys_Eft	MetpCis_Eft	Thr_Eft	Val_Eft	Iso_Eft	Trp_Eft	Lys_MM	MetpCys_MM	Thr_MM	Val_MM	Iso_MM
1	0.05	0.06	0.01	0.01	1.38	0.00	0.36	2.63	0.64	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	143.83	104.89	101.40	120.16	105.16	
2	0.25	0.30	0.03	0.03	4.57	0.01	1.01	15.76	2.73	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	473.80	329.35	326.53	384.31	338.22	
3	0.29	0.35	0.04	0.04	5.07	0.01	1.11	18.55	3.10	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	524.45	363.03	360.72	424.36	373.62	
4	1.12	1.29	0.09	0.15	12.48	0.03	2.38	94.65	9.79	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	1292.16	859.36	871.76	1024.63	904.08	
5	1.21	1.39	0.09	0.16	13.02	0.03	2.46	104.02	10.38	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	1348.80	895.02	908.95	1068.64	942.87	
6	2.78	2.84	0.12	0.39	17.88	0.07	3.11	282.37	17.18	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	1868.86	1211.33	1243.30	1475.13	1296.65	
7	2.90	2.94	0.12	0.40	18.00	0.08	3.11	297.62	17.49	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	1882.82	1218.87	1251.61	1486.56	1306.05	
8	4.00	3.79	0.12	0.57	17.77	0.11	2.97	440.21	19.15	NA	NA	0.77	0.78	0.73	0.73	0.69	0.71	1880.56	1205.90	1241.73	1492.89	1303.90	

Save

 Save Predictions as csv

Input values		Output values																
		Lys	Met+Cys	Thr	Val	Ile	Trp	Growth Curve										
		Lys_MM	MetpCys_MM	Thr_MM	Val_MM	Iso_MM	Trp_MM	LysRatio_MM	MetpCysRatio_MM	ThrRatio_MM	ValRatio_MM	IsoRatio_MM	TrpRatio_MM	Lys_EM	MetpCys_EM	Thr_EM	Val_EM	
1	143.83	104.89	101.40	120.16	105.16	25.14	100.00	72.92	70.49	83.54	73.11	17.48	164.62	101.85	123.56	119.68		
2	473.80	329.35	326.53	384.31	338.22	81.97	100.00	69.51	68.92	81.11	71.38	17.30	593.49	406.31	429.48	449.51		
3	524.45	363.03	360.72	424.36	373.62	90.66	100.00	69.22	68.78	80.92	71.24	17.29	657.76	451.92	475.30	499.01		
4	1292.16	859.36	871.76	1024.63	904.08	221.95	100.00	66.51	67.47	79.30	69.97	17.18	1588.33	1111.35	1137.20	1220.41		
5	1348.80	895.02	908.95	1068.64	942.87	231.63	100.00	66.36	67.39	79.23	69.90	17.17	1653.41	1157.35	1183.31	1271.41		
6	1868.86	1211.33	1243.30	1475.13	1296.65	321.03	100.00	64.82	66.53	78.93	69.38	17.18	2199.64	1540.51	1565.67	1713.14		
7	1882.82	1218.87	1251.61	1486.56	1306.05	323.51	100.00	64.74	66.48	78.95	69.37	17.18	2209.78	1547.27	1572.21	1723.14		
8	1880.56	1205.90	1241.73	1492.89	1303.90	324.27	100.00	64.12	66.03	79.39	69.34	17.24	2153.91	1503.36	1525.67	1700.15		

Save

 Save Predictions as csv

Input values		Output values		Lys	Met+Cys	Thr	Val	Ile	Trp	Growth Curve								
		Lys_EM	MetpCys_EM	Thr_EM	Val_EM	Iso_EM	Trp_EM	LysRatio_EM	MetpCysRatio_EM	ThrRatio_EM	ValRatio_EM	IsoRatio_EM	TrpRatio_EM	Lys_MM_FI	MetpCys_MM_FI	Thr_MM_FI	Va	
1	164.62	101.85	123.56	119.65	99.66	33.42	100.00		61.87	75.06	72.68	60.54	20.30	0.96	0.70	0.68		
2	593.49	406.31	429.48	449.51	363.22	116.16	100.00		68.46	72.37	75.74	61.20	19.57	1.08	0.75	0.74		
3	657.76	451.92	475.30	499.01	402.73	128.57	100.00		68.71	72.26	75.87	61.23	19.55	1.07	0.74	0.74		
4	1588.33	1111.35	1137.20	1220.41	975.40	308.16	100.00		69.97	71.60	76.84	61.41	19.40	1.04	0.69	0.70		
5	1653.41	1157.35	1183.31	1271.41	1015.53	320.73	100.00		70.00	71.57	76.90	61.42	19.40	1.03	0.68	0.69		
6	2199.64	1540.51	1565.67	1713.29	1354.25	426.33	100.00		70.03	71.18	77.89	61.57	19.38	0.89	0.58	0.59		
7	2209.78	1547.27	1572.21	1723.14	1360.77	428.30	100.00		70.02	71.15	77.98	61.58	19.38	0.88	0.57	0.58		
8	2153.91	1503.36	1525.67	1700.19	1329.23	417.72	100.00		69.80	70.83	78.93	61.71	19.39	0.77	0.49	0.51		

Save

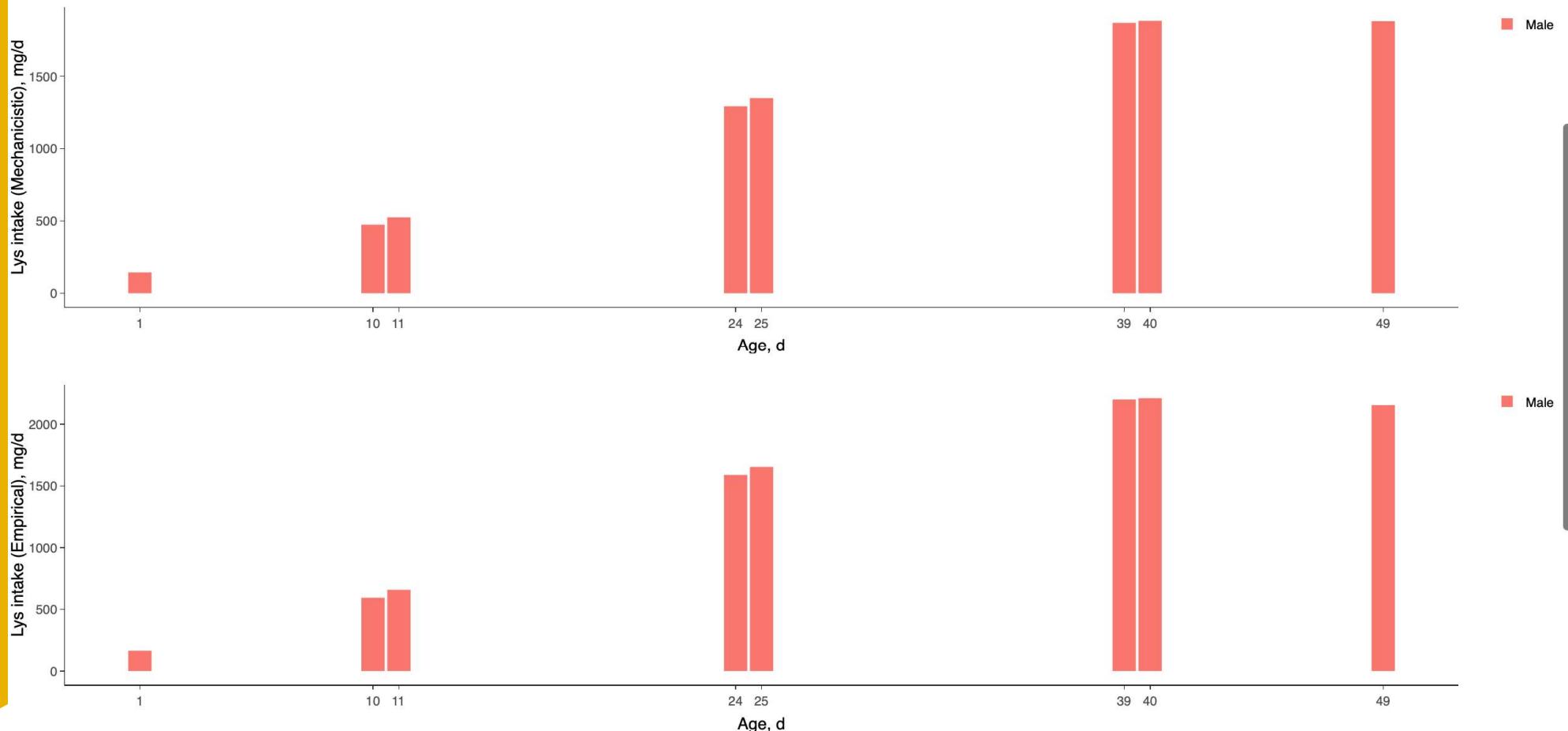
 Save Predictions as csv

	Input values		Output values												
	Lys	Met+Cys	Thr	Val	Ile	Trp	Growth Curve								
	ValRatio_EM	IsoRatio_EM	TrpRatio_EM	Lys_MM_FI	MetpCys_MM_FI	Thr_MM_FI	Val_MM_FI	Iso_MM_FI	Trp_MM_FI	Lys_EM_FI	MetpCys_EM_FI	Thr_EM_FI	Val_EM_FI	Iso_EM_FI	Trp_EM_FI
1	72.68	60.54	20.30	0.96	0.70	0.68	0.80	0.70	0.17	1.10	0.68	0.82	0.80	0.66	0.22
2	75.74	61.20	19.57	1.08	0.75	0.74	0.87	0.77	0.19	1.35	0.92	0.98	1.02	0.83	0.26
3	75.87	61.23	19.55	1.07	0.74	0.74	0.87	0.76	0.19	1.34	0.92	0.97	1.02	0.82	0.26
4	76.84	61.41	19.40	1.04	0.69	0.70	0.83	0.73	0.18	1.28	0.90	0.92	0.98	0.79	0.25
5	76.90	61.42	19.40	1.03	0.68	0.69	0.82	0.72	0.18	1.26	0.88	0.90	0.97	0.78	0.24
6	77.89	61.57	19.38	0.89	0.58	0.59	0.70	0.62	0.15	1.05	0.73	0.75	0.82	0.64	0.20
7	77.98	61.58	19.38	0.88	0.57	0.58	0.69	0.61	0.15	1.03	0.72	0.73	0.80	0.63	0.20
8	78.93	61.71	19.39	0.77	0.49	0.51	0.61	0.53	0.13	0.88	0.62	0.63	0.70	0.54	0.17

Save

 Save Predictions as csv

Input values Output values Lys Met+Cys Thr Val Ile Trp Growth Curve



Predictions of amino acid (AA) requirements for Broilers

Why should I use this Web App?

1. Estimate AA requirements of broiler chickens.
2. Compare empirical and mechanistic models.
3. Visualize AA requirements according to sex and line.
4. Download AA requirements in a CSV file for use in ration formulation programs.

Reference: Sakomura, N.K. et al., 2015. The Journal of Applied Poultry Research, 24, 267-282. Contact: sakomura@unesp.br

Web application developed by V.L. Daley, M.P. Reis, L.V.F.M. Carvalho et al. (2019). Contact: veridi7@vt.edu

Required Information

Choose a Line:
Ross

Choose an USA Category:
Late-developing

Choose a Sex:
Male

Choose a Range of Age
Day1 Day49 Day55

Choose an Ambient Temperature (Celsius)
18.8

Choose a Dietary Metabolizable Energy (Mcal/kg)
3.2

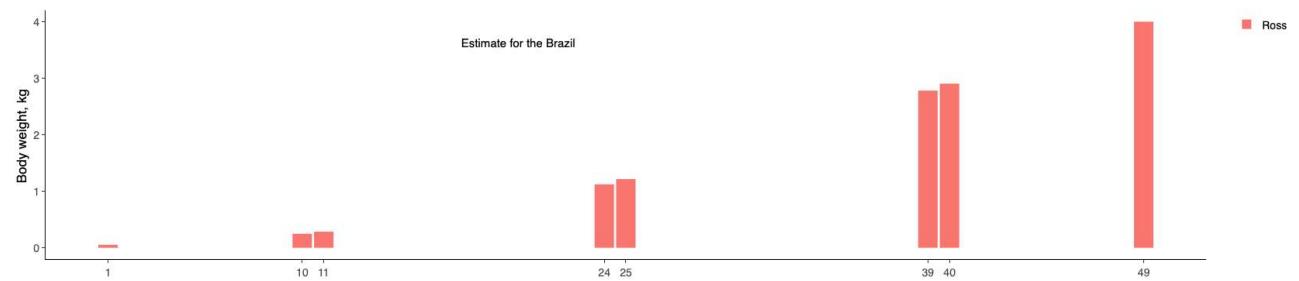
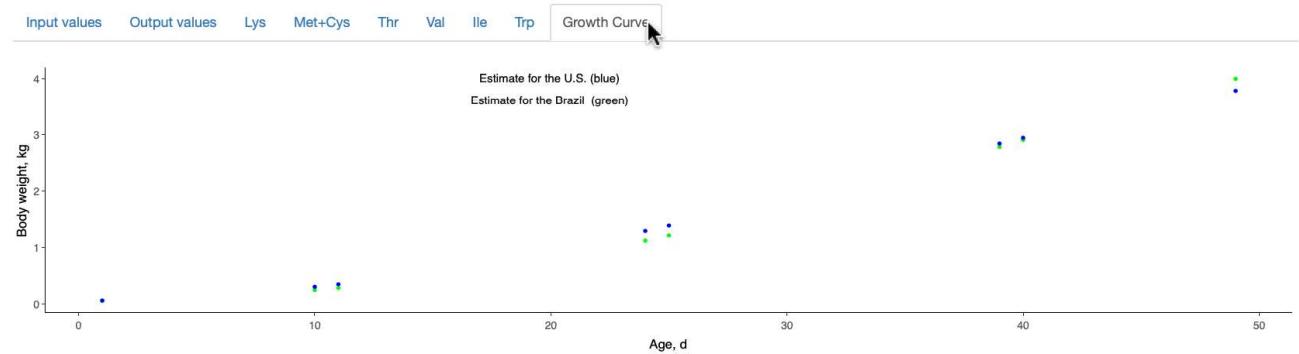
Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)
244

Update Table Clear

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR



Open #tab-4036-9 on this page in a new tab

3. Visualize AA requirements according to sex and line.

4. Download AA requirements in a CSV file for use in ration formulation programs.

Reference: Sakomura, N.K. et al., 2015. The Journal of Applied Poultry Research, 24, 267-282. Contact: sakomura@unesp.br

Web application developed by V.L. Daley, M.P. Reis, L.V.F.M. Carvalho et al. (2019). Contact: veridi7@vt.edu

Required Information

Choose a Line:

Choose an USA Category:

Choose a Sex:

Choose a Range of Age

Choose an Ambient Temperature (Celsius)

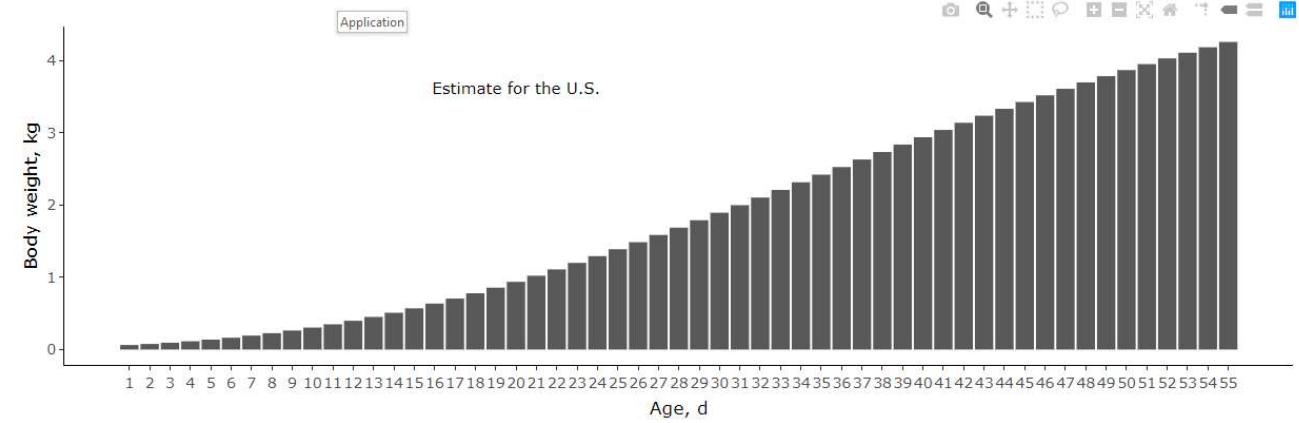
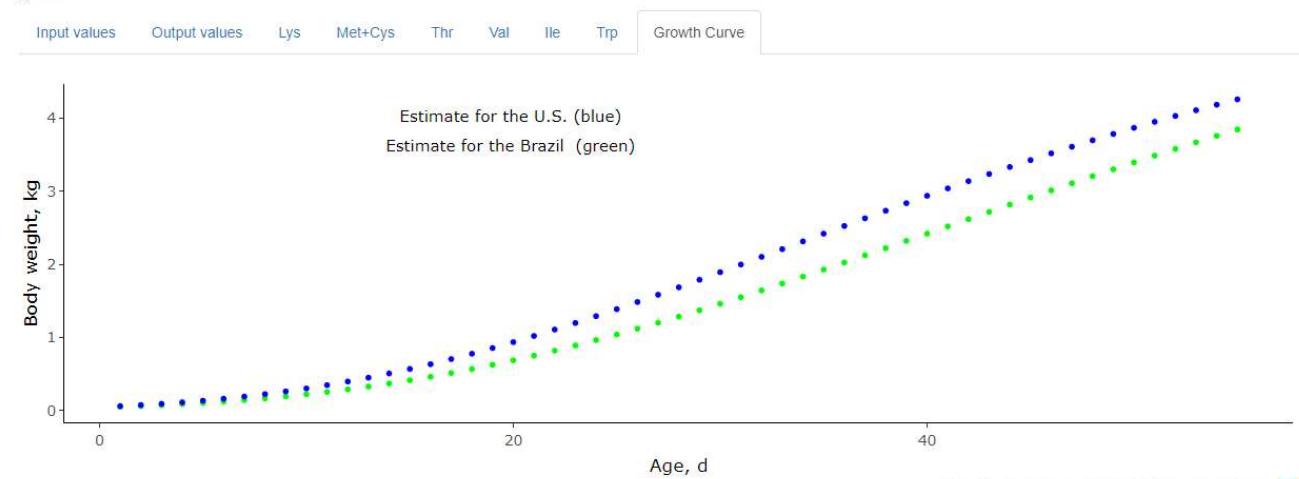
Choose a Dietary Metabolizable Energy (Mcal/kg)

Optional Information

Insert Body Weight (kg)

Insert Feed Intake (g/day)

Model developed by N.K. Sakomura et al. (2018), FCAV/UNESP, BR

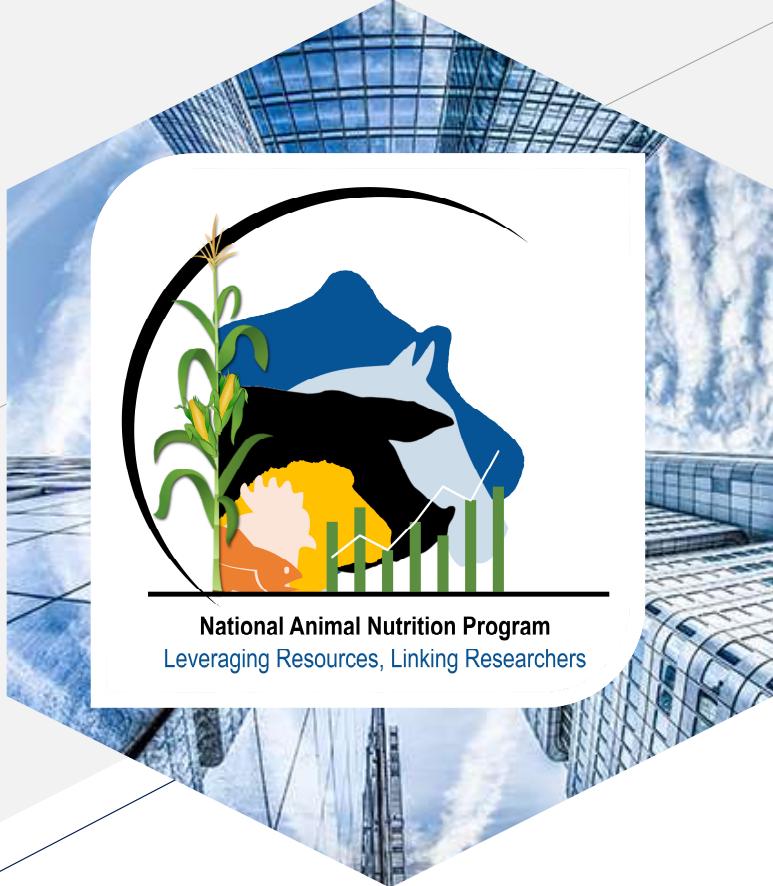


Animal Modeling



Application

- The factorial model predicts the digestible Lysine (Lys) requirements of broilers by considering body weight and weight growth.
- An interactive web application using Shiny in R was created to support simulations and data visualization by researchers and poultry nutritionists.



Thank You.



Veridiana L Daley



+1 (217) 904-6191



veridi7@vt.edu



<https://animalnutrition.org/>

Matheus de P. Reis

e-mail: matheusdpreis@gmail.com

Luiz Victor F. M. Carvalho

e-mail: lfcarval@ncsu.edu