

# Performance and Growth Curve Prediction of Crossbred Chickens from Crossing between Local Roosters and Layer Hens

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## ABSTRAK

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Permintaan ayam silangan (ayam Kampung x ayam petelur) terus meningkat. Tujuan dari penelitian ini adalah untuk mendapatkan ayam silangan terbaik dari hasil persilangan antara ayam lokal/asli/kampung dan ayam petelur yang menghasilkan bobot badan tertinggi sampai umur delapan minggu dan prediksi pertumbuhannya menggunakan fungsi Gompertz. Pada penelitian ini digunakan ayam kampung jantan sebanyak 18 ekor (9 ayam Bangkok, 9 ayam Pelung) dan 36 ayam betina petelur galur Isa brown, Lohman brown, dan Hyline brown (masing-masing 12 ekor) untuk menghasilkan 360 ekor ayam silangan. Faktorial 2x3 (2 ayam Kampung jantan versus 3 galur ayam petelur) menggunakan rancangan acak lengkap dengan 3 ulangan diterapkan dalam penelitian ini. Hasil penelitian menunjukkan bahwa terdapat interaksi antara ayam Kampung dan ayam petelur terhadap bobot badan ayam silangan umur 8 minggu. Ayam silangan hasil persilangan antara ayam Pelung dan ayam petelur galur Isa Brown memiliki bobot badan terbaik pada umur 8 minggu. Ayam silangan ini akan mencapai bobot dewasa 3026,89 g dengan bobot pubertas 1113,53 g dan umur pubertas 7,40 minggu. Kesimpulan penelitian ini adalah bahwa ayam silangan hasil persilangan antara ayam Pelung jantan dan ayam betina petelur galur Isa brown merupakan ayam silangan terbaik dengan bobot badan tertinggi pada umur 8 minggu. Ayam silangan ini bisa menjadi salah satu alternatif untuk pemenuhan kebutuhan ayam lokal di Indonesia karena umur potong dapat dipersingkat dari 8 bulan menjadi 8 minggu.

**Kata Kunci:** Persilangan. Ayam Kampung Jantan. Ayam Petelur, Bobot Badan, Fungsi Gompertz

## ABSTRACT

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Demand for crossbred chicken (Indonesian native chicken x laying hens) continues to increase. This study aimed to find the best-crossbred chicken resulting from crossing between local/native roosters and laying hens which produce the highest body weight up to eight weeks of age, and its growth prediction using the Gompertz function. Eighteen (18) native roosters (9 Bangkok roosters, 9 Pelung roosters) and 36 laying hens of strains Isa brown, Lohman brown, and Hyline brown (12 each) were used in this study to produce 360 crossbred chickens. Factorial 2x3 (two male local roosters versus three strains of laying hens) using a completely randomized design with 3 replications was applied in this study. The results showed an interaction between native roosters and layer hens on the body weight of crossbred chickens at eight weeks of age. Crossbred chicken from crossing between Pelung rooster and Isa brown layer hen was the best in body weight at eight weeks of age. This crossbred chicken would reach a mature weight of 3026.89 g with an inflection weight of 1113.53 g and an inflection age of 7.40 weeks. In conclusion, crossbred chicken from crossing between Pelung roosters and layer hens of Isa brown strain was the best crossbred with the highest body weight at eight weeks of age. This crossbred chicken could be an alternative for fulfilling the demand for local chicken in Indonesia because the slaughter age could be shortened from 8 months to 8 weeks.

**Key Words:** Crossbreeding, Local Rooster, Layer Hen, Body Weight, Gompertz Function

## INTRODUCTION

According to a report from the Central Statistics Agency (BPS), in 2021, the average consumption of chicken meat in Indonesia reached 0.14 kg per capita per week or 7.28 kg per year. This figure increased by 7.69% compared to 2020. Furthermore, the consumption of

local/native chicken and broiler meat based on data from the Ministry of Agriculture of The Republic of Indonesia in 2018 was 782 grams and 5.68 kg per capita per year, respectively. Therefore, consumption of chicken meat increased by 24.9% (local chicken) and 11.2% (broiler) compared to the previous year. Meanwhile, the consumption of local/native chicken eggs and layer

chicken eggs was 4,067 and 106,418 eggs per capita, respectively. This egg consumption rate also increased by 14.71% (local chickens) and 6.64% (layer) compared to the previous year. Based on these data, it can be seen that the increase in consumption of local chicken meat and eggs was higher than that of broiler meat or layer eggs; this is due to the increasing awareness of the community to live a healthy lifestyle, considering that local chicken meat and eggs contain lower fat and cholesterol and the taste of local chicken meat and eggs are more delicious (savory) compared to broiler meat and layer chicken eggs (Siburian et al. 2021; Setyanovina et al. 2021; Wardiny et al. 2020). In addition, local chicken eggs contain higher levels of omega-3 fatty acids and vitamins E, A, and D than layer chicken eggs. However, the increased demand for local chicken meat and eggs cannot be fulfilled by the availability of meat or egg supply from broiler or layer.

The low contribution/availability of local chicken meat and eggs compared to broiler meat and layer chicken eggs might be because of the low population and production capacity of local chickens compared to broilers and layers chicken. Meat productivity indicated by the length of time to reach a certain body weight in local chickens is lower (360 grams/head / eight weeks) than in broilers that reach a body weight of 1.3 kg/head / four weeks. Meanwhile, the productivity of local chicken eggs is lower (30-80 eggs/head/year) compared to layers (351 eggs/head/year) (Rajab & Papilaya 2012; Lapihu et al. 2019). This condition is an opportunity to spur and develop market prospects and the local chicken farming industry. One of the solutions to improve the productivity of local chickens is by crossing local chickens with layers.

Increasing the population and productivity of local chicken meat and eggs through crossing with layers is an inexpensive and easy way to do it at the small and medium-scale farmer and livestock industry level. Moreover, this business is strongly supported by the high wealth and biodiversity of local chickens in Indonesia. Indonesia has 33 types of local chickens scattered in various regions, including Nunukan chicken, Kedu chicken, Merawang chicken, Pelung chicken, Bekisar chicken, Cemani chicken, and Bangkok chicken. On the other hand, research on crossbred performance and growth curves resulting from crosses between native and layer hens was limited.

Lapihu et al. (2019) reported that the body weight of chicken resulting from crossing between male Bangkok, Sabu, and Bare Neck (Legund) chickens with laying hens (strain Isa brown) were 1204.85±137.33 g, 1154.00±190.06 g, and 1085.89±111.45 g, respectively. However, those authors included only one strain of layer hens, without other large local chicken (Pelung rooster) (Puspita et al. 2021) was not included in the experiment. Furthermore, many researchers reported that the

Gompertz function was the best growth predictor for the chicken growth curve (Akinsola et al. 2021; Hoang et al. 2021; Putra & Fajrina 2021; Sariyel et al. 2017). Therefore, the objective of the current study was to find the best crosses between local roosters and layers hens that produce the highest body weight and to predict its growth curve using the Gompertz function.

## MATERIALS AND METHODS

This research was conducted on the Zumar breeder farm in Tulungagung Village, Gading Rejo District, Pringsewu Regency. The research material used in this study were 54 chickens consisting of Pelung roosters and Bangkok roosters (1-2 years old), nine each, and three strains of laying hens, 12 each. Factorial 2x3 with a completely randomized design and three replications was assigned to this experiment. The first factor was two roosters of local chickens (Pelung and Bangkok roosters) aged 1-1.5 years with an average body weight of 3.25 kg for the Bangkok rooster and 4.53 kg for the Pelung rooster, and the second factor was three strains of laying hens (Isa brown, Lohman brown, and Hyline brown) aged 29-30 weeks with an average body weight of 1.86 kg/head.

Chickens were placed in 18 cages measuring 1 m long x 1 m wide by 2 m high so that one rooster mates with two laying hens with three replications. Chickens are fed (L-83-1) to produce eggs by supplying drinking ad-libitum. The resulting eggs were hatched using a hatching machine with ten eggs for each parent so that the number of eggs hatched was 360 eggs. In this study, the hatchability of eggs reached 76%. After these eggs were hatched, DOC (day-old chick) was weighed to determine the hatching weight every week for eight weeks. The DOC was fed with BR-1 feed (starter feed) for 28 days, then continued with BR-2 feeding until eight weeks.

The variables observed were hatching Weight and weekly chicken weight for eight weeks. The research data in the form of body weights from 0-8 weeks were tabulated using the Excel program and then analyzed for variance using the R program to determine the influence of the main factors and the interaction between the two factors. The growth curve of the best crossbred was described and predicted using the Gompertz function ( $y \sim a \cdot \exp(-b \cdot \exp(-c \cdot x))$ ) with  $y$  as body weight at age  $x$ ,  $a$  as mature body weight,  $b$  as the first part of growth before inflection point and  $c$  as the second part in which growth rate decreases until the animal reaches the mature Weight ( $a$ ), inflection weight was calculated as  $a/e$  and age of inflection was calculated as  $(\ln(b))/c$  (Akinsola et al. 2021; Arando et al. 2021; Hrncar et al. 2021; Hoang et al. 2021; Putra & Fajrina 2021; Tjørve & Tjørve 2017; Nguyen et al. 2023; Afrouziyeh et al. 2021).

## RESULTS AND DISCUSSION

### Body weight of crossbred chickens

The growth of crossbred chickens due to crossing between male Bangkok chickens and three female laying hens is shown in Table 1 and Figure 1. The results of this study showed that the crosses between the Bangkok rooster and layer hens of the Isa brown strain produced male crossbred chickens with the highest body weight from 0-4 weeks of age and at 7-8 weeks of age, followed by crosses between male Bangkok chickens with Lohman brown and Hyline brown.

Based on Table 1 and Figure 1, it can be seen that, at first, growth was relatively slow, followed by a high growth rate at a later age; this can be seen at the age of 3-4 weeks, for example, the increase in body weight of male chickens from crossing Bangkok roosters and Lohman layer strain increases sharply (104.40 g, from 183.20 g - 287.60 g), while at week 1-3, the body weight

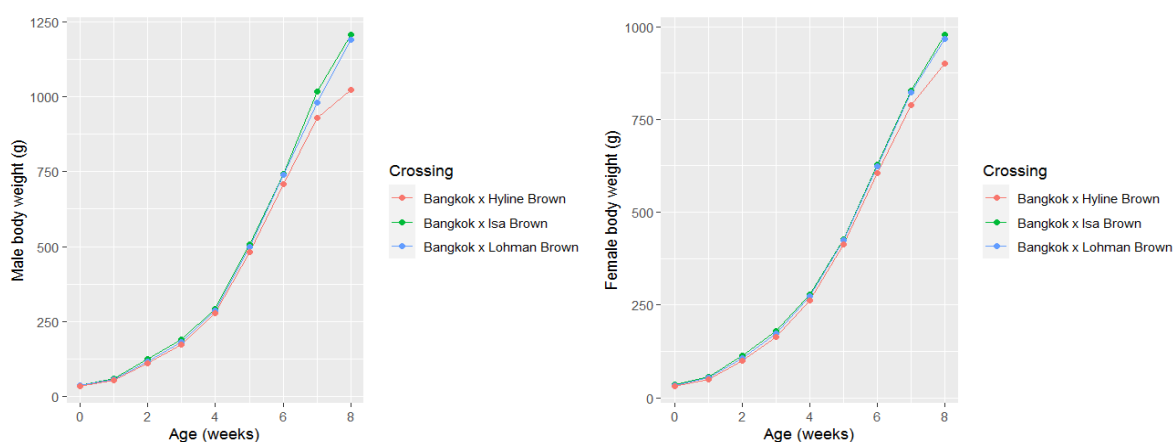
gain of chickens is 20.77, 59.63 and 65.33 g, respectively. Likewise, the growth of 4-8 weeks has increased sharply and can reach above 1000 g (1 kg). The results of this study are higher than those of Kholik et al. (2019), who reported that the increase in body weight at week 4 of Garut super chicken (crossbred from crossing Pelung, Kedu, and Sentul roosters and layer hens) fed with Pasak Bumi meal (*Euricoma longifolia* Jack) ranged from 74.30 g - 83.60 g.

Similar to the Bangkok rooster, the results of crosses between the Pelung rooster and three strains of layer hens showed that the offspring of crosses between the Pelung rooster and layer hens of the Isa brown strain produced the highest body weight from 0-4 weeks of age, followed by Lohman brown strain, and Hyline brown strain. The growth of crossbred resulting from crossing between the Pelung rooster and three strains of layer hens can be seen in Table 2 and Figure 2, which was similar to crossbred resulting from crossing between the Bangkok rooster and the three strains of layer hens.

**Table 1.** The growth of crossbred chickens as the result of crossing between Bangkok rooster and three strains of laying hens

Age (week)	Male crossbred			Female crossbred		
	1	2	3	1	2	3
0	38.40	37.47	35.33	34.90	34.13	38.40
1	60.63	58.23	55.60	56.23	53.50	60.63
2	124.20	117.87	111.50	112.30	107.33	124.20
3	189.23	183.20	174.27	179.10	173.03	189.23
4	292.33	287.60	277.37	277.73	274.40	292.33
5	508.33	499.67	482.67	427.67	425.33	508.33
6	743.33	740.00	708.33	628.00	624.00	743.33
7	1018.00	980.33	929.00	827.33	823.00	1018.00
8	1205.33	1190.67	1021.33	977.33	968.00	1205.33

Crossbred 1= Bangkok x Isa brown, Crossbred 2= Bangkok x Lohman brown, Crossbred 3= Bangkok x Hyline brown



**Figure 1.** Graph of growth of male and female crossbred chickens (aged 0-8 weeks) resulted from crosses between Bangkok roosters and three strains of layer hens

Table 2. The growth of crossbred chickens as the result of crossing between Pelung rooster and three strains of laying hens

Age (week)	Male crossbred			Female crossbred		
	1	2	3	1	2	3
0	39.73	38.47	35.73	36.10	34.77	39.73
1	62.20	61.00	55.77	56.93	55.70	62.20
2	129.20	124.67	109.53	115.07	114.50	129.20
3	191.93	186.47	180.93	176.73	177.47	191.93
4	296.33	291.17	277.60	282.17	274.17	296.33
5	519.00	513.33	495.33	434.00	424.67	519.00
6	755.33	751.33	709.33	632.67	626.33	755.33
7	1084.67	994.00	940.67	843.67	831.67	1084.67
8	1227.67	1212.67	1040.67	983.00	973.67	1227.67

Crossbred 1= Pelung x Isa brown, Crossbred 2= Pelung x Lohman brown, Crossbred 3= Pelung x Hyline brown

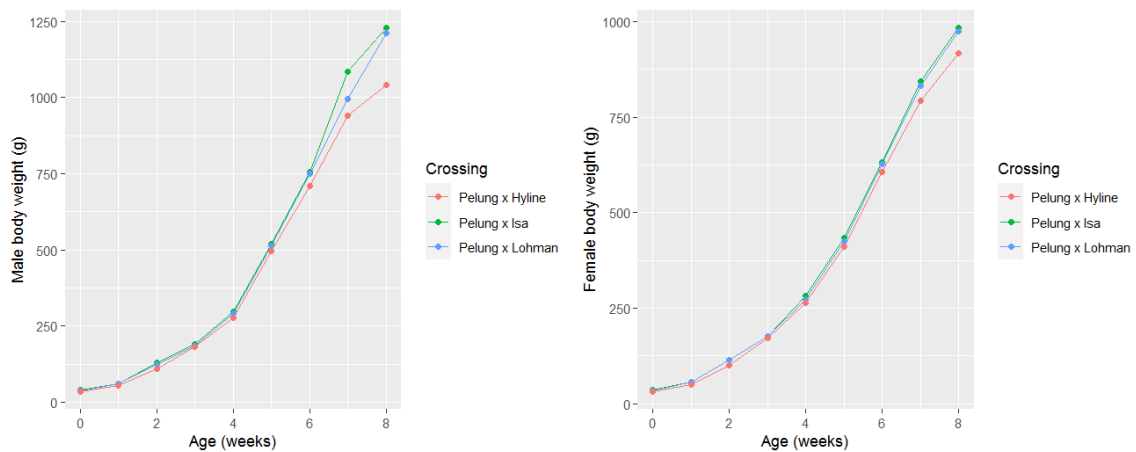


Figure 2. Graph of growth of male and female crossbred chickens (aged 0-8 weeks) resulted from crosses between Pelung roosters and three strains of layer hens

The result of this study was comparable with the result reported by Jacob et al. (2019) that the body weight of super native chicken at 12 weeks of age added with Gedi leaf juice (*Abelmoschus manihot L. medik*) in drinking water ranged from 1226.6 g to 1287.8 g. Munira et al. (2016) reported that Super native chicken fed ration substituted with different fermented rice bran resulted in body weight at ten weeks of age ranging from 837.50 g to 903.89 g. Anggraini et al. (2019) reported that Super native chicken with turmeric powder addition in diets resulted in body weight at eight weeks of age (56 days of age) ranging from 724.92±39.00 g - 853.67±62.72 g.

**The effect of treatment on body weight of crossbred chickens**

The results showed that there was an interaction between the treatment of local roosters (Bangkok and

Pelung roosters) and the treatment of layer hen strains (Isa brown, Lohman brown, and Hyline brown) on body weight of male and female crossbred chicken (0-8 weeks of age). Based on Table 3 and Table 4 (for example), crossbred chicken resulted from crossing between Pelung rooster and Isa brown strain of layer hen was the highest in body weight at 0 and 8 weeks of age both in male and female crossbred chickens.

Crosses between male Pelung chickens and Isa brown layer strain produced the highest body weight of crossbred chickens (39.73 g in males and 36.10 g in females at 0 weeks of age (DOC); 1227.67 g for males and 983.00 g for females at eight weeks of age). The results also showed that for both Bangkok and Pelung roosters, using the Isa brown strain of layer hen produced the highest crossbred chickens.

The research aiming to evaluate the production and reproduction performance of crossed BL (male Bangkok x female layer) and LB (male Layer x female Bangkok) indicated that the hatching Weight of the crossbred DOC

was  $29.67 \pm 0.63$  g (LB) and  $38.49 \pm 0.43$  g (BL) (Badaruddin et al. 2017). The results of this study were higher than those of Kholik et al. (2019) on Garut super chicken (crossbred from crossing Pelung, Kedu, and Sentul roosters and layer hens) fed with Pasak Bumi meal (*Euricoma longifolia* Jack) ranged from 510.20 g to 657.00 g at week 8. The results of this study were also higher than the body weight results of crossing Bangkok roosters and layer hens reported by Pagala et al. (2019), namely 265.38 g in male crossbred chickens and 256.19 g for female crossbred chickens at five weeks of age, reported by Herlina and Ibrahim (2019) that Super Kampung chicken (crossbreed between a local male rooster and laying hens) with the addition of the salam leaf powder in the ration ranged from 797g to 869.75 g at slaughter age (45 days of age). Sopian et al. (2014)

reported that crossing between male Pelung x female Sentul chicken (PS) and between male Sentul x Kampung chicken (SK) resulted in body weight of 1237 g and 1096 g in male and female offspring at 12 weeks of age, for PS cross and 1009 g and 823 g in male and female offspring at 12 weeks of age, respectively for SK cross. Trisiwi (2016) evaluated various dietary protein levels' effects on compensatory growth at 9-12 weeks of female crossbred between male native chicken and laying hens whose body weight at nine weeks ranged from 447.8 g to 860.8 g. These differences in the body weight of crossbred chickens may be due to differences in the parents' body weight, which are genetically inherited/passed on to the offspring.

The performance of male and female crossbred chickens due to crossing between Bangkok rooster and

**Table 3.** Body weight of crossbred chicken at 0 weeks of age (g)

Layer hen strain	Local rooster		Average
	Bangkok	Pelung	
<b>Male</b>			
Isa brown	38.40 <sup>ab</sup>	39.73 <sup>a</sup>	39.07
Lohman brown	37.47 <sup>bc</sup>	38.47 <sup>ab</sup>	37.97
Hyline brown	35.33 <sup>d</sup>	35.73 <sup>cd</sup>	35.53
Average	36.66	37.14	
<b>Female</b>			
Isa brown	34.90 <sup>ab</sup>	36.10 <sup>a</sup>	35.50
Lohman brown	34.13 <sup>b</sup>	34.77 <sup>b</sup>	34.45
Hyline brown	31.47 <sup>c</sup>	32.00 <sup>c</sup>	31.73
Average	33.13	33.58	

Different superscripts showed significant differences ( $P < 0.05$ )

**Table 4.** Body weight of crossbred chicken aged eight weeks (g)

Layer hen strain	Local rooster		Average
	Bangkok	Pelung	
<b>Male</b>			
Isa brown	1205.33 <sup>bc</sup>	1227.67 <sup>a</sup>	1216.50
Lohman brown	1190.67 <sup>cd</sup>	1212.67 <sup>ab</sup>	1201.67
Hyline brown	1021.33 <sup>f</sup>	1040.67 <sup>e</sup>	1031.00
Average	1150.33	1168.25	
<b>Female</b>			
Isa brown	977.33 <sup>b</sup>	983.00 <sup>a</sup>	980.17
Lohman brown	968.00 <sup>d</sup>	973.67 <sup>bc</sup>	970.83
Hyline brown	900.67 <sup>f</sup>	916.67 <sup>e</sup>	908.67
Average	953.00	960.83	

Different superscripts showed significant differences ( $P < 0.05$ )

**Table 5.** Performance of male and female crossbred resulted from Bangkok rooster

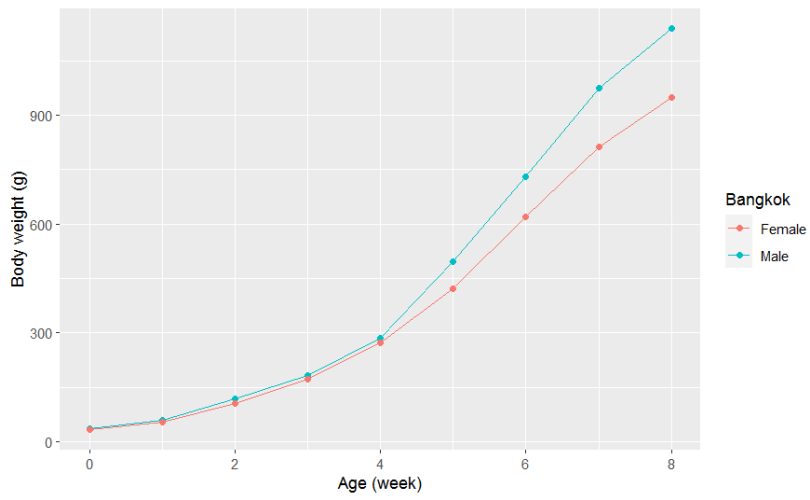
Age (weeks)	Male crossbred	Female crossbred
0	37.07	33.50
1	58.16	53.31
2	117.86	106.76
3	182.23	172.14
4	285.77	271.68
5	496.89	421.78
6	730.56	619.44
7	975.78	813.22
8	1139.11	948.67

**Table 6.** Performance of male and female crossbred resulted from Pelung rooster

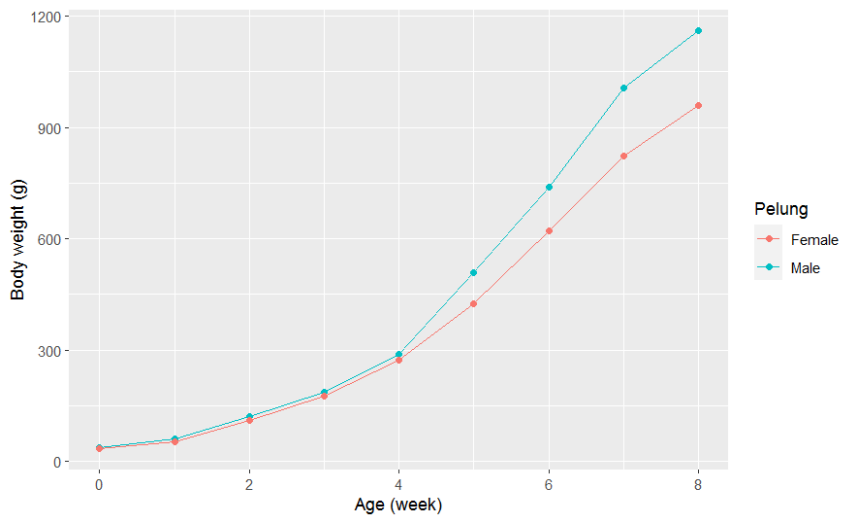
Age (weeks)	Male crossbred	Female crossbred
0	37.07	34.29
1	59.66	54.00
2	121.13	110.19
3	186.44	174.98
4	288.37	273.51
5	509.22	423.44
6	738.67	621.78
7	1006.44	822.67
8	1160.33	957.78

**Table 7.** Performance crossbred resulted from Bangkok and Pelung rooster

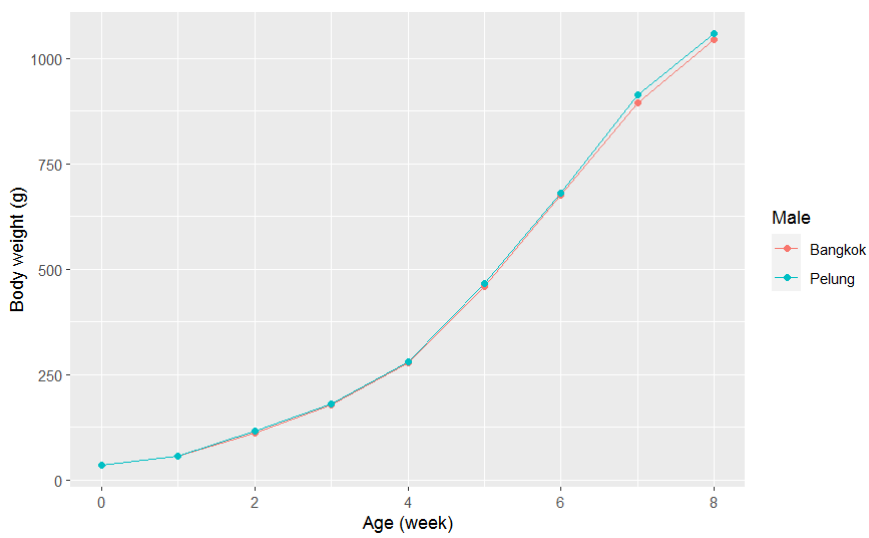
(weeks)	Crossbred from Bangkok rooster	Crossbred from Pelung rooster
0	35.28	35.68
1	55.73	56.83
2	112.31	115.66
3	177.19	180.71
4	278.72	280.94
5	459.33	466.33
6	675.00	680.22
7	894.50	914.56
8	1043.89	1059.06



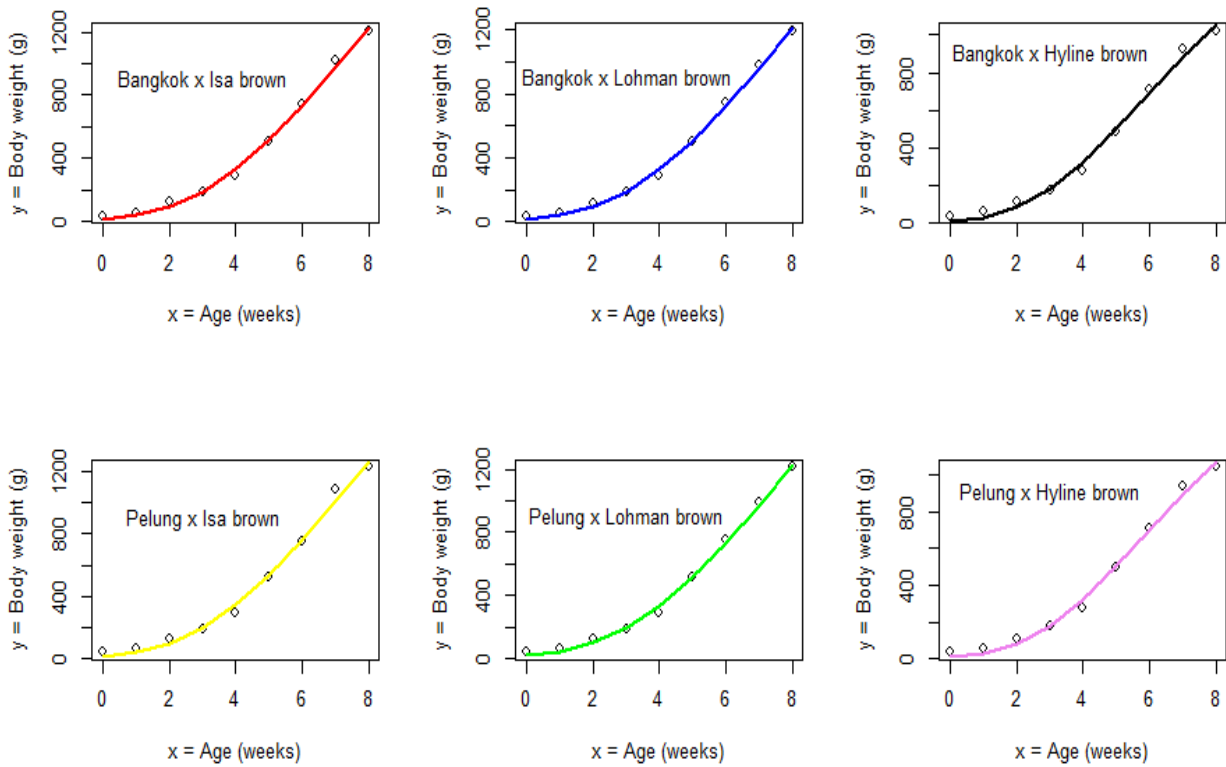
**Figure 3.** Graph of growth of male and female crossbred chickens (aged 0-8 weeks) resulted from crosses between Bangkok roosters and three strains of layer hens



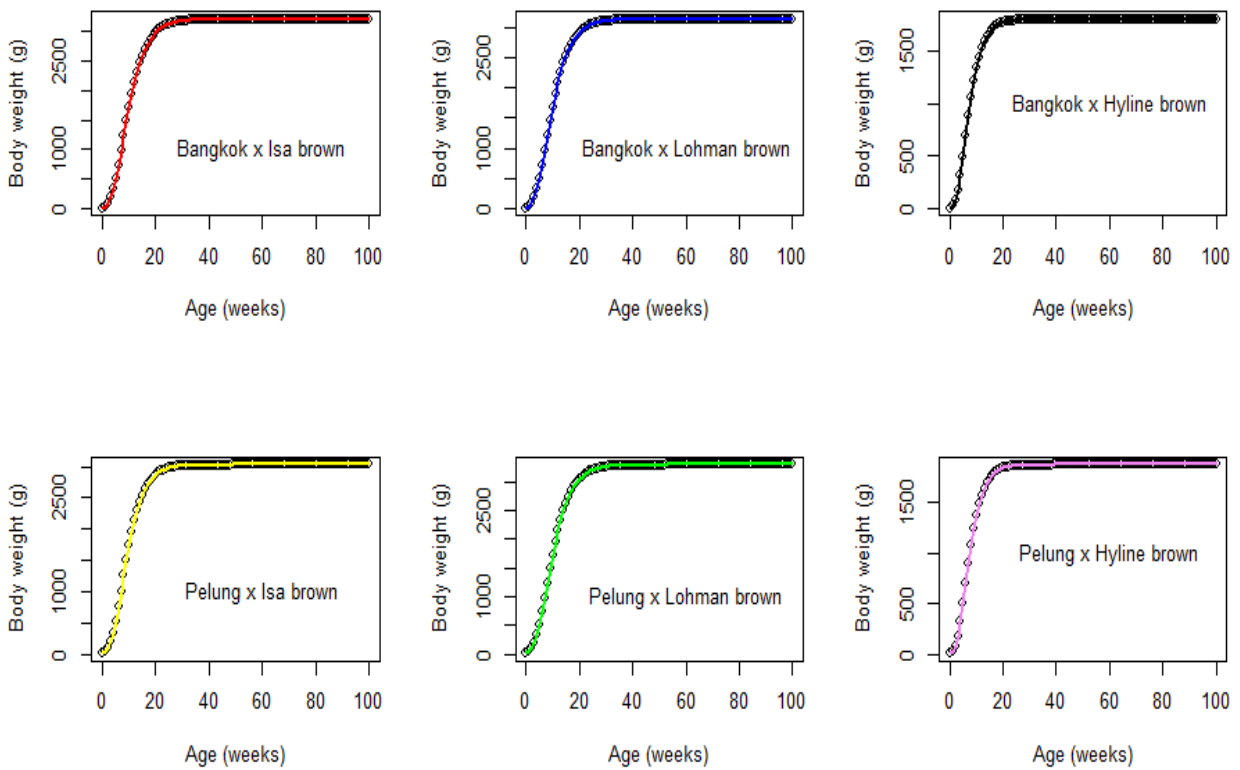
**Figure 4.** Graph of growth of male and female crossbreds resulted from crosses between Pelung rooster and three strains of layer hens aged 0-8 weeks



**Figure 5.** Graph of growth of crossbred chickens (aged 0-8 weeks) resulted from crosses of Pelung and Bangkok roosters with three strains of layer hens



**Figure 6.** The growth curve of crossbred chicken (aged 0-8 weeks) resulted from crosses of Bangkok and Pelung roosters with three strains of layer hens, predicted using the Gompertz function



**Figure 7.** Growth curve prediction of crossbred chicken (0-100 weeks of age) resulted from crosses of Bangkok and Pelung roosters with three strains of layer hens, predicted using the Gompertz function



**Table 8.** Estimated growth curve parameters of crossbred chicken from 0 to 8 weeks

Crossbred	Parameters									
	a	b	c	WPOI	APOI	AIC	BIC	R <sup>2</sup>	Adj.R <sub>2</sub>	RSE
Bangkok x Isa	3193.001	5.3585	0.2157	1174.64	7.78	91.4	92.19	0.9965	0.996	30.48
Bangkok x Lohman	3131.254	5.3751	0.2163	1151.92	7.78	88.21	88.99	0.9975	0.9972	25.53
Bangkok x Hyline	1800.041	5.5813	0.2936	662.20	5.86	95.22	96.01	0.9934	0.9924	37.7
Pelung x Isa	3026.898	5.4805	0.2299	1113.53	7.40	97.95	98.74	0.9932	0.9923	43.86
Pelung x Lohman	3296.985	5.3261	0.2107	1212.89	7.94	88.82	89.61	0.9974	0.997	26.41
Pelung x Hyline	1872.427	5.5275	0.2871	688.83	5.96	94.61	95.4	0.994	0.9931	36.43

a= mature body weight, b= the first part of growth before the inflection point, c= the second part in which the growth rate decreases until the animal reaches the mature Weight, WPOI= Weight at the point of inflection (in grams), APOI= age at the point of inflection (in weeks), AIC= Akaike Information Criterion, BIC= Bayesian Information Criterion RSE= Residual Standard Error, R<sup>2</sup>= coefficient of determination, Adj.R<sub>2</sub>= adjusted coefficient of determination

**Table 9.** Predicted body weight (week 0-100) of crossbred chicken resulted from crosses between Pelung rooster and Isa brown strain of layer hen

Week	Predicted body weight (g)					
[0]	12.620	38.910	95.188	193.767	340.838	533.854
[6]	762.529	1012.226	1267.715	1515.943	1747.379	1956.201
[12]	2139.767	2297.819	2431.679	2543.573	2636.135	2712.074
[18]	2773.967	2824.148	2864.666	2897.272	2923.443	2944.405
[24]	2961.168	2974.554	2985.233	2993.745	3000.525	3005.924
[30]	3010.220	3013.637	3016.356	3018.517	3020.235	3021.602
[36]	3022.687	3023.550	3024.236	3024.781	3025.214	3025.559
[42]	3025.832	3026.049	3026.222	3026.359	3026.468	3026.555
[48]	3026.624	3026.679	3026.722	3026.757	3026.784	3026.806
[54]	3026.823	3026.837	3026.848	3026.856	3026.863	3026.869
[60]	3026.873	3026.877	3026.879	3026.882	3026.883	3026.885
[66]	3026.886	3026.887	3026.887	3026.888	3026.888	3026.889
[72]	3026.889	3026.889	3026.889	3026.889	3026.890	3026.890
[78]	3026.890	3026.890	3026.890	3026.890	3026.890	3026.890
[84]	3026.890	3026.890	3026.890	3026.890	3026.890	3026.890
[90]	3026.890	3026.890	3026.890	3026.890	3026.890	3026.890
[96]	3026.890	3026.890	3026.890	3026.890	3026.890	3026.890

three layers of layer hens is presented in Table 5 and Figure 3. The body weight of male crossbred chickens was higher than that of female crossbred. This result also happens with the crossing between the Pelung rooster and three strains of layer hens resulting in the body

weight of male crossbred chickens being higher than that of female crossbred chickens (Table 6 and Figure 4).

Table 7 and Figure 5 show us that the body weight of the crossbred from the Pelung rooster was a bit higher than that of the Bangkok rooster; this might be due to the

higher body weight of the Pelung rooster (4.5 kg on average) that of Bangkok rooster (3.25 kg on average).

Table 8, Figures 6 and 7 tell us that the mature Weight of crossbred chicken, for example, crossbred chicken resulted from crosses between the Pelung rooster and Isa brown strain of layer hen which was predicted using Gompertz function ( $y \sim a \cdot \exp(-b \cdot \exp(-c \cdot x))$ ;  $y = 3026.89 \cdot \exp(-5.48 \cdot \exp(-0.23 \cdot x))$ ) will be 3026.89 g (a parameter) with inflection weight (a/e) of 1113.53 g and age of inflection ((ln(b))/c) at 7.40 weeks. Estimated growth curve parameters for the rest of the crossbred can be seen in Table 8. This study also showed that the mature Weight of a crossbred resulting from crossing between the Pelung rooster and Isa brown layer hen could be reached at about 28 weeks of age with a body weight of around 3000 g (Table 9).

Based on Table 8 and Figure 6, the prediction of body weight of crossbred chicken from age 0-8 weeks was entirely accurate with a coefficient of determination of 0.9932 for crossbred resulting from crossing between Pelung rooster and Isa brown layer hens. The results of this study are not much different from previous studies in that the Gompertz function is very accurate in describing growth curves in various types of poultry (Michalczuk et al. 2016; Eleroğlu et al. 2014; Masoudi & Azarfar 2017; N'dri et al. 2018; Adenaike et al. 2017; Urfa et al. 2017; Anang et al. 2017; Cyril et al. 2021; Nguyen et al. 2023; Brito et al. 2021; Hagan et al. 2022).

## CONCLUSION

Based on the results of this study, it can be concluded that the cross between Pelung roosters and layer hen of Isa brown strain produced crossbred chicken with the highest body weight at eight weeks of age. This crossbred chicken would reach an inflection weight of 1113.53 g at an inflection age of 7.40 weeks and a mature Weight of 3026.89 g. Therefore, this crossbred chicken could be an alternative for fulfilling the demand for local chicken in Indonesia because the slaughter age could be shortened from 8 months to 8 weeks.

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