

Constraints and benefits of KUB chicken cultivate in Central Java Province, Indonesia

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Abstract. Indonesian Agency for Agricultural Research and Development has released the KUB (Kampung Unggul Balitbangtan) chicken to increase the contribution of local chickens to the national meat supply for community's animal protein needs. This paper aims to determine the constraints and benefits of KUB chickens cultivating in Central Java Province. Data analysis was carried out using descriptive methods with qualitative and quantitative approaches. The R/C analysis results showed that breeders would get more significant profit by raising KUB chickens (2.38) compared to local native chickens (1.72). KUB chicken farming faces several obstacles, including suboptimal productivity of eggs and chicken meat, limited availability of KUB chicken seeds, inadequate location and size of the cage, attacks of poultry disease during the transition season and low access to bank credit. Therefore, it is advisable to cultivate KUB chickens in battery cages in a broader area to optimise the productivity and minimise mortality rates. The government can encourage seed resources management unit (UPBS) and collaborate with private companies and independent breeders to carry out KUB chicken breeding to increase the availability of KUB chicken seeds. The government is also expected to facilitate an access to bank credit for KUB chicken breeders, especially for business capital.

1 Introduction

The livestock subsector has an important role, especially in meeting protein needs [1]. Consumption of protein derived from meat, milk, and micronutrients (iron, zinc, vitamins B and A) can improve children's cognitive growth and health. Besides, protein adequacy is significantly associated with the nutritional status of children under five [2, 3], since children under five who have a protein deficit will cause the stunting [4].

To meet the protein needs of animals, the Ministry of Agriculture has made several policies, including the release of the Balitbangtan Superior Village Chicken varieties [5]. Kampung Ayam Unggul Balitbangtan (KUB) is a chicken product of research conducted by the Research Institute for Animal Husbandry-Agricultural Research and Development Agency since 1997. Currently, the licensor for KUB chickens is PT SUI (Indonesian Poultry

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Feeder). KUB chickens are pure native chickens selected by female lines for six generations. One generation requires 12-18 months of research time. The source of KUB chicken seeds comes from superior native chickens from various regions in West Java (Jatiwangi, Depok, Karakal Ciawi, Cianjur) and DKI Jakarta.

KUB chicken has promising prospects, both economically and socially, because it can supply high nutritious food needs and has local and regional market absorption capacity. One of the advantages of KUB chickens are disease resistance, egg production per year 160-180 eggs, feed consumption 80-85 grams, incubation of 10% of the total population, age at first laying 22-24 weeks, egg weight 35-45 grams and feed conversion 3.8 [6]. The free-range chicken business gave good performance through improving the maintenance system from a semi-intensive one to an intensive one and leading to agribusiness [7].

In recent decades, there has been a shift from small-scale chicken rearing systems to intensive farming systems [8, 9]. Intensive small-scale rearing will provide more efficient productivity [10-13]. Furthermore [14, 15] revealed that as populations continue to increase, many countries have expanded intensive poultry production to meet demand animal source food products that are rich in protein. The free-range chicken business is relatively easy to maintain with simple technology and can be sold at any time if there are urgent household needs [16]. Meanwhile, another advantage of KUB chickens is that they are able to produce higher eggs compared to ordinary free-range chickens [17].

The results of the study [18] that KUB chickens are selected free-range chickens that have several advantages with more egg production compared to ordinary free-range chickens and have higher disease resistance than purebred chickens. Even since 2017, efforts have been made to breed local chickens covering 3 strata, namely 1) Strata-1, which is chicken breeding carried out at UPT Balitbangtan, with more adequate facilities and infrastructure and control), 2) Strata-2, breeding at the national level; nucleus and cultivation at the plasma level, 3) Strata-3, cultivation at the household level [19].

The Agriculture-Based Prosperous People Poverty Surgery Program (BEKERJA) is one of the programs implemented by the Research and Development Agency of the Ministry of Agriculture in socializing KUB chickens. According to [23], raising KUB chickens in the BEKERJA program in Hulu Sungai Utara Regency, South Kalimantan shows the potential to be developed. This is represented by: (i) egg production 65-67%, egg weight 36.12-38.12 g / grain and (ii) seeds with egg budding between 90.21-92.61%, hatchability 79.67-81.18% and DOC weight ranged from 34.50-36.86 g / head. According to [24] KUB chicken rearing provides greater benefits than the current commercial banking interest rate. From observations on the hatchability of KUB chicken eggs, the number of fertile eggs incubated was 75%. Some results of research that the hatchability of native chickens is very varied is 55.21%; 75.26%; 73.31%; 71,67 [20-22].

According to [25] that as a follow-up to the utilization of Indonesia's local chicken genetic resources is the development of the local chicken national industry, which will require various scientific and technological discoveries based on local chicken genetic resources. Therefore, specifically this paper wants to know the problems faced (constraints) in the KUB chicken farming business and the benefits obtained from the KUB chicken farming business, especially in increasing the household income of breeders in Central Java Province.

2 Methodology

The research was conducted in 2020 in Central Java Province as one of the recipient locations for the KUB chicken rearing program. With the same criteria, a group of breeders in Batang was selected as the research location. The data collected consisted of: (i) secondary data obtained from Puslitbangnak, BB Veterinary Research, and Balitnak; (ii) primary data

obtained from direct interviews using a questionnaire to 3 groups of KUB chicken breeders, 3 KUB chicken traders and 3 KUB chicken consumers. Apart from collecting primary data at the research location, information was also collected through Focus Group Discussions (FGD) at the national and provincial levels. The data analysis was carried out in a descriptive quantitative and RC (Revenue – Cost) ratio analysis.

3 Result and discussion

3.1 KUB's chicken livestock business performance

The advantages of KUB chicken compared to ordinary native chickens as an alternative for people to cultivate them are : (1) the production of KUB chicken eggs that are cultivated intensively reaches 160-180 eggs / parent / year, while the native chickens are only 146 eggs / parent / year; (2) The weight of first hens lay eggs reach 35-36 grams and it will continue to increase to 45 grams / grain in the second month; (2) The first age to lay eggs is 20-22 weeks and fourth body weight reaches 1,200-1,600 grams; (3) Good taste of chicken meat and higher egg productivity. The chemical composition of KUB chicken meat which was cut at the age of 10 weeks, namely, water content of 73.41%, 24.55% protein, 1.83% fat and 0.14% cholesterol.

In order to encourage the dissemination of KUB chickens, the government includes the KUB chickens in the assistance package of Ministry of Agriculture's BEKERJA program. Farmers who receive the assistance program are prioritized for poor families who are interested in raising chickens as an additional source of family income. The program is carried out in 17 provinces and each province is represented by 100 households. Each household receives 20 chicks (DOC). The provinces participating in this activity are: North Sumatra, West Sumatra, South Sumatra, Riau, Lampung, Banten, West Java, Central Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, Central Kalimantan, South Kalimantan, Gorontalo, Central Sulawesi and South Sulawesi. In fact, in 2011, more than 10,000 KUB docs have been disseminated to local chicken farmers throughout Indonesia, pioneering collaboration with breeding partners in breeder groups in West Java and Yogyakarta [26].

Table 1. Realization and target of PT SUI's chicken DOC

No.	Island	Realization of 2019	Target of 2020
1	Sumatera	200.300	1.500.000
2	Jawa	160.225	2.000.000
3	Bali	4.000	300.000
4	NTT	10.000	300.000
5	NTB	140.000	500.000
6	Sulawesi	18.700	800.000
7	Kalimantan	7.400	600.000
	Total	540.625	6.000.000

Source : PT SUI 2020 [27]

One company that has received a license from Balitbangtan and is involved in distributing KUB chickens is PT Sumber Unggas Indonesia (SUI) which is domiciled in Parung District, Bogor Regency. PT SUI cultivates KUB chickens and hatches eggs to obtain DOC which are then sold to various parties, either directly breeders or companies that carry out enlargement businesses either independently or in collaboration with a business partnership pattern (nucleus-plasma cooperation). In 2019, PT SUI distributed 540,625 KUB chickens to 27 provinces in Indonesia [27]. In 2020, PT SUI targets to market KUB chickens in Indonesia as many as 6,000,000 DOCs (Table 1).

The distribution of KUB chickens in Central Java Province is not only carried out by PT SUL, but there are still several other producers involved (Table 2). His involvement is in the form of nurseries aimed at dissemination, commercial and for the needs of certain group members. In 2020 KUB chicken breeding there is a group that has just started production, there is a group that is producing and there is a group that has produced KUB chicken DOC of 19,100 DOC. Central Java, since 2017 AIAT has developed local KUB chickens through the Strata 2 and Strata 3 programs. Strata 2 is more for provision among farmer groups, while Strata 3 is aimed directly at farmers by receiving DOC assistance packages and KUB chicken feed. And in 2020, the ANAK AKUB livestock group has been established whose business is integrated from upstream to downstream. Through the KUR program, it is hoped that its development will be even greater.

UPBS BPTP Central Java is one of the KUB chicken DOC providers that has distributed 150,321 DOCs during the work program period 2018 to 2020. The KUB chicken DOCs were distributed to the BEKERJA program as many as 76,282 birds, 16,618 chickens disseminated, 55,421 independent chickens and replacement activities amount as 2,000 tail.

Table 2. KUB chicken nurseries in Central Java, 2020

No.	DOC's Producer	Production capacity per/month	Information
1	UPBS BPTP Central Java	6000	Disemination and commercial
2	Chairman of the ANAK AKUB Association	2500	commercial
3	Holy independent breeder	6000	commercial
4	Independent farmer in Pati	600	commercial
5	Farmers in Karanganyar	1000	commercial
6	The independent Koramil Klego Boyolali	Production started	commercial
7	Farmers in Grobogan (3 breeders)	2300	commercial
8	Independent breeders in Magelang	700	commercial
9	Blessing Group in Brebes	Production started	commercial
10	Ex. Sedyo Utomo in Semarang	Production started	commercial
11	KWT Wijaya Kusuma in Tegal	Production on going	Meet the needs of members
12	KBM Qoryah Thoyyibah Salatiga		
13	Ponpes Al Furgon Brebes		

3.2 Maintenance of KUB Chickens in Central Java Province

One of the farmer groups that takes part in the KUB chicken breeding activities is the Mekartani village chicken farmer group located in Krengseng Village, Gringsing District, Batang Regency. The assistance of 48 roosters and 200 hens was obtained in 2012. The assistance was then distributed to the members and the members were expected to return the aid in the form of chicken eggs. The Mekartani group will hatch the chicken eggs to be used as seeds.

DOC assistance to the Mekartani group all came from the Central Java AIAT. The types of KUB chickens received have black legs and black feathers (Table 3). Of the total members of the farmer group that received assistance, 96 percent are used to raising chickens and 40 percent are raising other types of chickens. The farmer group members are interested in raising KUB chickens because the selling price is stable and the cultivation technique is relatively easy.

Central Java AIAT provides assistance to breeders / livestock groups in the form of technical guidance. The technical guidance is carried out when the farmer buys the KUB chicken DOC to UPBS BPTP Central Java. This is done to provide knowledge on how to raise KUB chickens that are efficient, especially for breeders who have just raised KUB chickens. In addition, there is also consultation and post-purchase supervision of KUB chicken DOCs (in person and online) to monitor if there are breeders who experience problems in cultivating KUB chickens.

Table 3. The demonstration of KUB chicken rearing activities in Batang Regency. 2020

No.	Description	Group response
1.	Types of KUB chickens being raised (%) a. Black legs and black fur b. black legs gray fur c. Yellow feet	100,00 0,00 0,00
2.	DOC sources of information on raising KUB chickens (%) a. PT. Poultry Source b. Central Java AIAT c. PPL	0,00 100,00 0,00
3.	Reasons for the respondents raising KUB chickens (%) a. Prices are more stable b. Easy and understand cultivation techniques c. DOC price considerations (Cheap)	100,00 100,00 0,00
4.	Respondents who also raise other types of chickens (%)	40,00

Source: Primary database processed, 2020

3.3 Benefits of maintaining KUB chickens

The development of KUB chicken in Central Java Province has shown positive results. This is shown by the increasing demand for KUB chicken seeds to UPBS BPTP Central Java. During the period 2018–2019, UPBS BPTP Central Java has produced around 95,598 KUB chickens and in 2020 it has been able to produce 6,000 KUB DOCs per month. The chicken seeds of KUB BPTP Central Java have been marketed to 33 of 35 districts / cities in Central Java Province.

Meanwhile, in terms of benefits, breeders who raise KUB chickens will get a greater profit than raising ordinary free-range chickens. This can be seen from the results of the R / C analysis in one cycle of raising 5,000 chickens. Farmers who raise KUB chickens have an R / C value of 2.38, while farmers who raise ordinary native chickens have an R / C value of only 1.72. The amount of income of KUB chicken farmers is due to the lower mortality rate so that they produce more crops. In addition, the selling price is higher than that of ordinary native chickens (Table 4).

Table 4. Comparison of the results of the analysis of KUB chicken farming and local native chickens for a scale of 5,000 head in Batang Regency, 2019

Description	KUB chicken	Local native chicken	Difference (%)
	1	2	1-2
A. Revenue			
1. Tail equivalent yield (tail)	4.650	4.500	3,33
2. Price (Rp/Kg)	59.000	44.000	34,09
3. Value of revenue (Rp)	274.350.000	198.000.000	38,56
B. Production cost (Rp)	115.211.800	115.211.800	xxx
C. Livestock business profits(Rp)	159.138.200	82.788.200	92,22
D. Price of BEP (Rp/Kg)	24.777	25.603	xxx
E. R/C	2,38	1,72	38,56

Source: Primary database processed, (2020)

3.4 Problems in KUB's Chicken Livestock Business at the Licensor Level

The big obstacle experienced by PT. The source of Indonesian poultry in the cultivation of native chickens is egg productivity which does not reach 50-60 percent as achieved by the Livestock Research Institute, Ciawi. However, when reanalyzed the difference in productivity occurs because the chickens raised by PT SUI are kept in open house colony cages, in contrast to the Animal Research Institute which cultivates KUB chickens in battery cages.

In colony cages, there is often competition between individual chickens in the coop so that the more dominant chickens will be able to feed the daily needs of body maintenance, production and reproduction. Meanwhile, for the losing chickens, they will more often be perched at the top of the cage and have little access to feed. In the future, it is hoped that there will be a re-development of the performance of native chickens produced by the Livestock Research Institute so that their productivity can be even better in any type of cage considering that many people have not been able to get access to good chicken housing. With the superiority of KUB chickens in terms of cage tolerance, it is hoped that more people will cultivate KUB chickens. Some of the problems felt by UPBS BPTP Central Java and KUB chicken breeders, among others:

Limited DOC of KUB chicken

Farmers find it difficult to get DOC. This is because there are still a few independent breeders who produce DOCs and the limitations of Central Java BPTP UPBS in producing KUB chicken DOCs.

Limited business area

The land area owned by breeders is very limited for raising KUB chickens. Usually breeders make a chicken coop in the yard of the house which is about 1 to 2 meters from the house. This condition can cause disruption to the health of breeders. On the other hand, the development of KUB chickens to achieve business/commercial business scale will be very difficult to do if only each individual breeder is working on it.

Not yet optimal in overcoming disease

Diseases that usually attack KUB chickens during the transition season are dysentery, chills and tetelo. If this disease cannot be handled properly, the mortality rate of KUB

chickens will increase. Meanwhile, breeders have not been optimal in dealing with it by providing the right medicine to cure the disease.

Competition with other types of chickens

Most consumers are still not used to consuming eggs and free-range chickens, let alone KUB eggs and chicken meat. So far, the need for eggs and chicken meat is mostly obtained from broiler chickens. Price is one of the reasons why people consume more broilers than free-range chickens.

Lack of support from banking

Currently, the banking sector still believes more in the excellence and sustainability of chicken or layer chicken farming, so that banking credit access is more open to broiler chicken farming compared to KUB chickens. This is due to the lack of information from the banking sector regarding the productivity of KUB chickens which are considered to be native chickens in general. KUB chicken farmers have difficulty fulfilling the rigid KUR credit requirements, because only experienced breeders are given credit while KUB chicken farming is relatively new. In addition, applying for credit in groups cannot be done, only credit applications can be done individually. This makes it difficult for breeders who want to apply for credit in groups to ease their credit burden.

4 Conclusion

The BEKERJA program implemented by Balitbangtan was quite successful in encouraging the dissemination of KUB chickens to the community, especially breeders in Central Java Province. The farmer is interested in cultivating KUB chickens because the maintenance is easy (the same as raising free-range chickens) and the selling price is relatively stable. Farmers will get a bigger profit if they raise KUB chickens than local free-range chickens.

Even so, there are still several problems in the KUB chicken farming business, including: (i) KUB chicken production is not optimal due to inadequate conditions of the breeders' cage, (ii) limited availability of KUB chicken DOC; (iii) farmers are still constrained in overcoming poultry disease during the transition season and (iv) difficulties in accessing banking institutions for business capital. Another obstacle, since 2019, PT SUI has experienced problems with regular sales because it has to meet the needs/demands of government projects, in this case the BEKERJA (Western People's Welfare Surgery) program of the Ministry of Agriculture.

Therefore, it is hoped that there will be support from the government through related agencies to provide assistance to breeders in raising KUB chickens so that it is expected to minimize losses due to livestock deaths. In addition, it is also hoped that there will be easy access to credit for KUB chicken breeders so that the breeders can get sufficient capital to develop their livestock business. The government is also expected to encourage increased production of KUB chicken DOC through the development of independent breeders who can cooperate with UPBS (BPTP Central Java). In the future, it is also hoped that there will be genetic improvement of KUB chickens so that it will increase its superiority compared to local free-range chickens and will contribute to increasing the income of breeders.

References

1. E. Pranata, Salmiah, Hutajulu. *Jurnal Agribisnis*. **2**, 9 (2013)
2. P. Anindita P. J. *Kesehatan Masyarakat*. **1**, 2 (2012)

3. R.D.M. Solihin, F. Anwar, D. Sukandar D. Panel Gizi Makan. **36**, 1 (2013)
4. F. Hanum, A. Khomsan, Y. Heryatno. *J. Gizi dan Pangan*. **9**, 1 (2014)
5. Badan Penelitian dan Pengembangan Pertanian. Percepatan penyebaran ayam KUB-1 melalui kerjasama pralicensi. Badan Penelitian dan Pengembangan Pertanian. Diunduh 7 Februari 2020. Tersedia dari: <http://new.litbang.pertanian.go.id/info-aktual/3222/>. (2019)
6. T. Sartika, S. Iskandar, D. Zainuddin, S. Sopiya, B. Wibowo dan A. Udjianto. Seleksi dan “Open Nucleus” Ayam KUB (Kampung Unggul Balitnak). Laporan Penelitian No: NR/G-01/Breed/APBN 2009. (2009)
7. D.M. Yuwono, F.R. Prasetyo. Prosiding Seminar Nasional Menggagas Kebangkitan Komoditas Unggulan Lokal Pertanian dan Kelautan. Madura (Indonesia): Fakultas Pertanian Universitas Trunojoyo Madura. (2013)
8. R. Laxminarayan, P. Matsoso, S. Pant, C. Brower, J.A. Røttingen, K. Klugman, S. Davies. *Lancet*, 387, (2016)
9. T.P. Van Boeckel, E.E. Glennon, D. Chen, M. Gilbert, T.P. Robinson, B.T. Grenfell, S.A. Levin, S. Bonhoeffer. *Science*, 80, 357 (2017)
10. R.G. Alders, R.A.E. Pym. *Poult. Sci. J.*, 65, (2009)
11. M. Vaarst, S. Steinfeldt, K. Horsted, D. Centre. *Reviews Sustainable development perspectives of poultry production*, 71, (2020)
12. A. Permin, J.C. Riise, K.N. Kryger. *World Poult. Sci. J.*, 61, (2005)
13. G. Mottet, G. Tempio. *World Poult. Sci. J.*, 73, (2017)
14. T. Ahmed, H.A. Ameer, S. Javed. *Trop. Anim. Health Prod.*, 53, (2021)
15. Y. Hu, H. Cheng, S. Tao. *Environmental and Human Health Challenges of Industrial Livestock and Poultry Farming in China and Their Mitigation* (2017)
16. Noferdiman, Fatati, H. Handoko. *J Pengabdian Masyarakat*. 29, (2014)
17. C. Hidayat, S. Iskandar, T. Sartika. *JITV* 16, (2011)
18. T. Sartika, D. Zainuddin, S. Iskandar, H. Resnawati, A.R. Setioko, Sumanto, A.P. Sinurat, Isbandi, B. Tiesnamurti, E. Romjali. *Ayam KUB-1*. Jakarta (Indonesia): Badan Penelitian dan Pengembangan Pertanian. (2013)
19. S. Iskandar, A. Sinurat. *Petunjuk teknis produksi ayam lokal pedaging unggul (Program pembibitan tahun 2017-2018)*. Bogor (Indonesia): Pusat Penelitian dan Pengembangan Peternakan. (2017)
20. L.O. Nafiu, M. Rusdin, A.S. Aku. *J. Ilmu Teknologi Peternakan Tropis*, 1, (2014)
21. N. Iriyanti, Z.T. Yuwanta, S. Keman. *Penggunaan vitamin E dalam pakan terhadap fertilitas, daya tetas, dan bobot tetas telur ayam kampung*. Yogyakarta (Indonesia): Fakultas Peternakan, Universitas Gajah Mada. (2005)
22. M.A.S. Zakaria. *J. Agrisistem*. 6, (2010)
23. Suryana. *WARTAZOA* 27, 1 (2017)
24. A. Priyanti, T. Sartika, Priyono, T.B. Yuliyanto, T.D. Soedjana, S. Bahri, B. Tiesnamurti. *Kajian Ekonomi dan Pengembangan Inovasi Ayam Kampung Unggul Balitbangtan (KUB)*. Pusat Penelitian dan Pengembangan Peternakan. Badan Litbang Pertanian. Bogor. [24] (2016)
25. T. Sartika. *T. Kinerja dan permasalahan penyebaran KUB di Indonesia*. Bahan PPT. Balitnak- Bogor. (2020)
26. S. Iskandar. *Panduan pelaksanaan pengembangan ayam KUB*. Edisi khusus untuk pengembangan di 10 propinsi. Balai Penelitian Ternak. (2011)
27. PT. Sumber Unggas Indonesia (SUI). *Data pemasaran dan penyebaran ayam KUB*. PT. SUI. Bogor. (2020)