Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Manuscript MH20221008051025 is submitted to Journal Advances in Animal and Veterinary Sciences

1 pesan

Manuscript Handler <info@manuscripthandler.com> 12 Oktober 2022 pukul 12.14
Balas Ke: Manuscript Handler <info@manuscripthandler.com>
Kepada: maskur@unram.ac.id
Cc: journals@researcherslinks.com

Dear Maskur Maskur,

Your manuscript entitled "Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat" has been successfully submitted online and is presently being given full consideration for publication in the Advances in Animal and Veterinary Sciences.

Your manuscript ID is MH20221008051025

Please mention the above manuscript ID in all future correspondence or when calling the office for questions. If there are any changes in your street address or e-mail address, please log in at https://www.manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences and edit your user information as appropriate.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to https://www.manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences .

Thank you for submitting your manuscript to the Advances in Animal and Veterinary Sciences.

Sincerely,

Editorial Office

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your manuscript in Advances in Animal and Veterinary Sciences has been assigned an Editor

1 pesan

Manuscript Handler <info@manuscripthandler.com> 17 Oktober 2022 pukul 23.11
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <journals@researcherslinks.com>
Kepada: maskur@unram.ac.id

Dear Dr. Maskur Maskur,

Your manuscript entitled has passed initial quality controls and is now been assigned an Editor. This is a standard procedure to check the contents and quality of all new and revised manuscripts. After editorial considerations, the manuscript may be sent to selected reviewers for peer-review process. After editorial considerations, the manuscript will be sent to selected reviewers for peer-review process. Please note that review process is on the disposal of reviewer's responses. We strive our best to make first decision at the earliest possible; however, your patience in this matter will be highly appreciated.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to
http://manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences/login">
http://manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences/login

Thank you for submitting your manuscript and we will keep you updated with any further progress in the peer-review process of the manuscript.

Sincerely,

Editorial Office

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

Turnitin Originality Report

Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat by R L

From Articles (Articles)

- Processed on 17-Oct-2022 18:47 PKT
- ID: 1927674388
- Word Count: 5103

Similarity Index
27%
Similarity by Source

Internet Sources:
22%
Publications:
24%
Student Papers:
4%

sources:

1 2% match (Internet from 05-Mar-2022)
http://researcherslinks.com/current-issues/Microsatellites-and-Morphometric-Diversity-Among-Indonesian-Local-Duck-Populations-in-Lombok-Island/33/1/4757/html

2 2% match (Internet from 30-Sep-2022)
https://academicjournals.org/journal/AJB/article-full-text/64D601559047

3 2% match (X. P. An, J. X. Hou, H. B. Zhao, G. Li, L. Bai, J. Y. Peng, Q. M Yan, Y. X. Song, J. G. Wang, B. Y. Cao. " Polymorphism identification in goat and genes and their association analysis with litter size ", Animal Genetics, 2013)
X. P. An, J. X. Hou, H. B. Zhao, G. Li, L. Bai, J. Y. Peng, Q. M Yan, Y. X. Song, J. G. Wang, B. Y. Cao. " Polymorphism identification in goat and genes and their association analysis with litter size ", Animal Genetics, 2013

4 1% match (Internet from 01-Oct-2022)
https://researcherslinks.com/current-issues/Microsatellites-and-Morphometric-Diversity-Among-Indonesian-Local-Duck-Populations-in-Lombok-Island/33/1/4757

5 1% match (Internet from 23-Sep-2022)
http://animalproduction.net/index.php/JAP/article/download/597/pdf

6 1% match (Rosa B López-Ramírez, Héctor F Magaña-Sevilla, Roberto Zamora-Bustillos, Julio P Ramón-Ugalde, Daniel González-Mendoza. "ANALYSIS OF THE 3´ END REGIONS OF THE GDF9 AND BMPR1B GENES IN BLACKBELLY SHEEP FROM YUCATÁN, MEXICO", Ciencia e investigación agraria, 2014)
Rosa B López-Ramírez, Héctor F Magaña-Sevilla, Roberto Zamora-Bustillos, Julio P Ramón-Ugalde, Daniel González-Mendoza. "ANALYSIS OF THE 3´ END REGIONS OF THE GDF9 AND BMPR1B GENES IN BLACKBELLY SHEEP FROM YUCATÁN, MEXICO", Ciencia e investigación agraria, 2014

7 1% match ()
Jansson, Towe. "Genes involved in ovulation rate and litter size in sheep", 2014

8 1% match (Internet from 17-Jul-2022)
https://www.researchgate.net/publication/7249782_Polymorphism_of_FecB_Gene_in_Nine_Sheep_Breeds_or_Strains_and_Its_Effects

9 1% match (Lopes, T.A., J.J.N. Costa, R.P. Ribeiro, J.R.S. Passos, M.A.A. Soares, J.G. Alves Filho, E.V. Cunha, R. van den Hurk, A.A. Pinheiro, and J.R.V. Silva. "Influence of caprine arthritis encephalitis on expression of ovulation related genes and activation of primordial follicles cultured in presence of phytohemagglutinin, epidermal growth factor or both", Small Ruminant Research, 2015.)
Lopes, T.A., J.J.N. Costa, R.P. Ribeiro, J.R.S. Passos, M.A.A. Soares, J.G. Alves Filho, E.V. Cunha, R. van den Hurk, A.A. Pinheiro, and J.R.V. Silva. "Influence of caprine arthritis encephalitis on expression of ovulation related genes and activation of primordial follicles cultured in presence of phytohemagglutinin, epidermal growth factor or both", Small Ruminant Research, 2015.

10 1% match (M Maskur, R Tapaul, L Kasip. "Genetic polymorphism of bone morphogenetic protein receptor 1B (BMPR-1B) gene and its association with litter size in Indonesian fat-tailed sheep", African Journal of Biotechnology, 2016)
M Maskur, R Tapaul, L Kasip. "Genetic polymorphism of bone morphogenetic protein receptor 1B (BMPR-1B) gene and its association with litter size in Indonesian fat-tailed sheep", African Journal of Biotechnology, 2016

11 1% match (Internet from 27-Dec-2021)

http://library.cvasu.ac.bd:8080/bitstream/handle/123456789/1369/Introduction%20to%20Reference.pdf?sequence=5

12 1% match (Internet from 23-Nov-2019)

https://www.tandfonline.com/doi/full/10.1080/10495390701331114

13 1% match (Sangharatna V. Bahire, Pradeep K. Rajput, Vijay Kumar, Davendra Kumar, Meena Kataria, Satish Kumar. "Quantitative expression of mRNA encoding BMP/SMAD signalling genes in the ovaries of Booroola carrier and non-carrier GMM sheep", Reproduction in Domestic Animals, 2019)

Sangharatna V. Bahire, Pradeep K. Rajput, Vijay Kumar, Davendra Kumar, Meena Kataria, Satish Kumar. "Quantitative expression of mRNA encoding BMP/SMAD signalling genes in the ovaries of Booroola carrier and non-carrier GMM sheep", Reproduction in Domestic Animals, 2019

14 1% match (Internet from 06-Oct-2021)

http://www.researcherslinks.com/current-issues/Expression-Analysis-of-BMPR1B-BMP15-GDF9/20/1/2903/html

15 1% match (Internet from 07-Jun-2021)

http://repository.ipb.ac.id:8080/bitstream/handle/123456789/76886/234%2c%20Identification%20of%20GDF9%20Gene%20and%20its%isAllowed=y&sequence=1

16 1% match (Sheila Pourali, Seyyed-Ziaeddin Mirhoseini, Vincenzo Tufarelli, Navid Ghavi Hossein-Zadeh et al. "Investigating the Polymorphism of Bone Morphogenetic Protein Receptor-1B (BMPR1B) Gene in Markhoz Goat Breed", Animals, 2020)

Sheila Pourali, Seyyed-Ziaeddin Mirhoseini, Vincenzo Tufarelli, Navid Ghavi Hossein-Zadeh et al. "Investigating the Polymorphism of Bone Morphogenetic Protein Receptor-1B (BMPR1B) Gene in Markhoz Goat Breed", Animals, 2020

17 1% match (Internet from 17-Jul-2020)

https://mafiadoc.com/jitaa-neliti_5cc9e141097c478b2d8b46a1.html

18 1% match ()

Wouobeng, Patrick, Kouam Simo, Jaures et al. "Polymorphism of Prolificacy Genes (BMP15, BMPR 1B and GDF9), in the Native Goat (Capra hircus) of Cameroon", 'University of Tlemcen', 2019

19 1% match (Internet from 09-Apr-2022)

https://www.biorxiv.org/content/10.1101/2020.01.08.899443v3.full

20 < 1% match (Internet from 17-Jul-2022)

https://www.researchgate.net/publication/314553694_Genetic_polymorphism_in_FecB_gene_in_Iraqi_Sheep_Breeds_using_RFLP-PCR_technique

21 < 1% match (Internet from 14-Jul-2022)

https://coek.info/pdf-association-analysis-of-polymorphism-in-kiss1-gene-with-reproductive-traits-in-g.html

22 < 1% match (Internet from 01-Oct-2021)

https://coek.info/pdf-current-status-of-molecular-genetics-research-of-goat-fecundity-.html

23 < 1% match (student papers from 14-Nov-2021)

Submitted to Higher Education Commission Pakistan on 2021-11-14

24 < 1% match (student papers from 22-Sep-2011)

Submitted to Higher Education Commission Pakistan on 2011-09-22

25 < 1% match (Internet from 12-Aug-2020)

https://aab.copernicus.org/most_downloaded_recent.html

26 < 1% match (Internet from 22-Sep-2022)

https://aab.copernicus.org/articles/65/105/2022/

27 < 1% match (Weimin Wang, Shijia Liu, Fadi Li, Xiangyu Pan, Chong Li, Xiaoxue Zhang, Youji Ma, Yongfu La, Rui Xi, Tingfu Li. "Polymorphisms of the Ovine BMPR-IB, BMP-15

and FSHR and Their Associations with Litter Size in Two Chinese Indigenous Sheep Breeds", International Journal of Molecular Sciences, 2015)

Weimin Wang, Shijia Liu, Fadi Li, Xiangyu Pan, Chong Li, Xiaoxue Zhang, Youji Ma, Yongfu La, Rui Xi, Tingfu Li. "Polymorphisms of the Ovine BMPR-IB, BMP-15 and FSHR and Their Associations with Litter Size in Two Chinese Indigenous Sheep Breeds", International Journal of Molecular Sciences, 2015

---

28 < 1% match (Internet from 03-Oct-2020)

https://www.e-sciencecentral.org/articles/pubreader/SC000013895

---

29 < 1% match (Internet from 25-Sep-2022)

https://journal.veterinaria-sarajevo.com/vfs/index.php/journal/article/download/110/77/211

---

30 < 1% match (R. Abdoli, P. Zamani, A. Deljou, H. Rezvan. "Association of BMPR-1B and GDF9 genes polymorphisms and secondary protein structure changes with reproduction traits in Mehraban ewes", Gene, 2013)

R. Abdoli, P. Zamani, A. Deljou, H. Rezvan. "Association of BMPR-1B and GDF9 genes polymorphisms and secondary protein structure changes with reproduction traits in Mehraban ewes", Gene, 2013

---

31 < 1% match (Satish Kumar, Pradeep Kumar Rajput, Sangharatna V. Bahire, Basanti Jyotsana, Vijay Kumar, Davendra Kumar. "Differential expression of BMP/SMAD signaling and ovarian-associated genes in the granulosa cells of FecB introgressed GMM sheep", Systems Biology in Reproductive Medicine, 2020)

Satish Kumar, Pradeep Kumar Rajput, Sangharatna V. Bahire, Basanti Jyotsana, Vijay Kumar, Davendra Kumar. "Differential expression of BMP/SMAD signaling and ovarian-associated genes in the granulosa cells of FecB introgressed GMM sheep", Systems Biology in Reproductive Medicine, 2020

---

32 < 1% match (Yuqin Wang, Li Yuanxiao, Zhang Nana, Wang zhanbin, Bai Junyan. "Polymorphism of Exon 2 of BMP15 Gene and Its Relationship with Litter Size of Two Chinese Goats", Asian-Australasian Journal of Animal Sciences, 2011)

Yuqin Wang, Li Yuanxiao, Zhang Nana, Wang zhanbin, Bai Junyan. "Polymorphism of Exon 2 of BMP15 Gene and Its Relationship with Litter Size of Two Chinese Goats", Asian-Australasian Journal of Animal Sciences, 2011

---

33 < 1% match (Elisha Gootwine. "Invited Review: Opportunities for Genetic Improvement toward Higher Prolificacy in Sheep", Small Ruminant Research, 2020)

Elisha Gootwine. "Invited Review: Opportunities for Genetic Improvement toward Higher Prolificacy in Sheep", Small Ruminant Research, 2020

---

34 < 1% match (Z.Y. Pan, R. Di, Q.Q. Tang, H.H. Jin, M.X. Chu, D.W. Huang, J.N. He, Q.Y. Liu, W.P. Hu, X.Y. Wang, Y.X. Yao, L. Liu, C.L. Song. "Tissue-specific mRNA expression profiles of GDF9, BMP15, and BMPR1B genes in prolific and non-prolific goat breeds", Czech Journal of Animal Science, 2016)

Z.Y. Pan, R. Di, Q.Q. Tang, H.H. Jin, M.X. Chu, D.W. Huang, J.N. He, Q.Y. Liu, W.P. Hu, X.Y. Wang, Y.X. Yao, L. Liu, C.L. Song. "Tissue-specific mRNA expression profiles of GDF9, BMP15, and BMPR1B genes in prolific and non-prolific goat breeds", Czech Journal of Animal Science, 2016

---

35 < 1% match (Internet from 08-Nov-2020)

https://jurnal.ugm.ac.id/ijbiotech/article/view/42095

---

36 < 1% match (Internet from 06-Jul-2022)

https://mdpi-res.com/d_attachment/biomedicines/biomedicines-10-01583/article_deploy/biomedicines-10-01583.epub

---

37 < 1% match (Internet from 28-Sep-2017)

http://prr.hec.gov.pk/Thesis/2208S.pdf

---

38 < 1% match (Ahlawat, Sonika, Rekha Sharma, and A. Maitra. "Screening of indigenous goats for prolificacy associated DNA markers of sheep", Gene, 2013.)

Ahlawat, Sonika, Rekha Sharma, and A. Maitra. "Screening of indigenous goats for prolificacy associated DNA markers of sheep", Gene, 2013.

---

39 < 1% match (Internet from 25-Sep-2022)

https://dspace.emu.ee/bitstream/handle/10492/7174/EMU_PhD_Liina_Soonvald_2021%5b2141%5d_26173.pdf?isAllowed=y&sequence=1

---

40 < 1% match ()

Jianlei Jia, Qian Chen, Linsheng Gui, Jipeng Jin, Yongyuan Li, Qiaohong Ru, Shengzhen Hou. "Association of polymorphisms in bone morphogenetic protein receptor-1B gene exon-9 with litter size in Dorset, Mongolian, and Small Tail Han ewes", Asian-Australasian Journal of Animal Sciences

---

41 < 1% match (Shujiao Ma, Xuewen Ji, Ming Cang, Jianguo Wang et al. "Association analysis between novel variants in LEPR gene and litter size in Mongolia and ujimqin sheep breeds", Theriogenology, 2022)

Shujiao Ma, Xuewen Ji, Ming Cang, Jianguo Wang et al. "Association analysis between novel variants in LEPR gene and litter size in Mongolia and ujimqin sheep breeds", Theriogenology, 2022

---

42 < 1% match (Reshmi Sasi, Raji Kanakkaparambil, Aravindakshan Thazhathuveettil. "Polymorphism of fecundity genes, BMPR1B, BMP15 and GDF9, in tropical goat breeds of Kerala", Gene Reports, 2020)

Reshmi Sasi, Raji Kanakkaparambil, Aravindakshan Thazhathuveettil. "Polymorphism of fecundity genes, BMPR1B, BMP15 and GDF9, in tropical goat breeds of Kerala", Gene Reports, 2020

---

43 < 1% match ()

Islam, M, Basheer, A, Javed, K, Anjum, A.A., Zahoor, I. "PCR-RFLP-based identification of polymorphisms in BMPR1B, GDF9 and BMP15 genes associated with litter size in Beetal and Teddy goats", 'African Journals Online (AJOL)', 2019

---

44 < 1% match ("Abstracts of 14th FELASA congress 2019", Laboratory Animals, 2019)

"Abstracts of 14th FELASA congress 2019", Laboratory Animals, 2019

---

45 < 1% match (D. Kokoszyński, R. Wasilewski, K. Stęczny, M. Kotowicz, C. Hrnčar, H. Arpášová. "Carcass composition and selected meat quality traits of Pekin ducks from genetic resources flocks", Poultry Science, 2019)

D. Kokoszyński, R. Wasilewski, K. Stęczny, M. Kotowicz, C. Hrnčar, H. Arpášová. "Carcass composition and selected meat quality traits of Pekin ducks from genetic resources flocks", Poultry Science, 2019

---

46 < 1% match (Morteza Mahdavi, Shahram Nanekarani, Seyed Davood Hosseini. "Mutation in BMPR-IB gene is associated with litter size in Iranian Kalehkoohi sheep", Animal Reproduction Science, 2014)

Morteza Mahdavi, Shahram Nanekarani, Seyed Davood Hosseini. "Mutation in BMPR-IB gene is associated with litter size in Iranian Kalehkoohi sheep", Animal Reproduction Science, 2014

---

47 < 1% match (Sadreddin Anvari Majd, Ahmad Ahmadi, Reza Talebi, Pezhman Mahmoodi Koohi, Stéphane Fabre, Saber Qanbari. "Polymorphism identification in ovine KISS1R/GPR54 gene among pure and crossbreeds of Iranian sheep", Small Ruminant Research, 2019)

Sadreddin Anvari Majd, Ahmad Ahmadi, Reza Talebi, Pezhman Mahmoodi Koohi, Stéphane Fabre, Saber Qanbari. "Polymorphism identification in ovine KISS1R/GPR54 gene among pure and crossbreeds of Iranian sheep", Small Ruminant Research, 2019

---

48 < 1% match (Yufang Liu, Peng Wang, Zuyang Zhou, Xiaoyun He, Lin Tao, Yanting Jiang, Rong Lan, Qionghua Hong, Mingxing Chu. "Expression Profile Analysis to Identify Circular RNA Expression Signatures in the Prolificacy Trait of Yunshang Black Goat Pituitary in the Estrus Cycle", Frontiers in Genetics, 2022)

Yufang Liu, Peng Wang, Zuyang Zhou, Xiaoyun He, Lin Tao, Yanting Jiang, Rong Lan, Qionghua Hong, Mingxing Chu. "Expression Profile Analysis to Identify Circular RNA Expression Signatures in the Prolificacy Trait of Yunshang Black Goat Pituitary in the Estrus Cycle", Frontiers in Genetics, 2022

---

49 < 1% match (Internet from 05-Dec-2017)

https://core.ac.uk/download/pdf/46137491.pdf

---

50 < 1% match ()

Gunawan, Muhammad Indra. "Hubungan antara umur dengan bobot badan induk dan litter size kambing Senduro di kecamatan Senduro kabupaten Lumajang", 2019

---

51 < 1% match (Internet from 06-Oct-2022)

https://www.agriculturejournals.cz/publicFiles/165664.pdf

---

52 < 1% match (Internet from 27-Oct-2021)

https://www.frontiersin.org/articles/10.3389/fvets.2020.00406/full

---

53 < 1% match (Internet from 15-May-2020)

https://www.mdpi.com/2076-2615/9/11/886/htm

---

54 < 1% match (Jianlei Jia, Qian Chen, Linsheng Gui, Jipeng Jin, Yongyuan Li, Qiaohong Ru, Shengzhen Hou. "Association of polymorphisms in bone morphogenetic protein receptor-1B gene exon-9 with litter size in Dorset, Mongolian, and Small Tail Han ewes", Asian-Australasian Journal of Animal Sciences, 2019)

Jianlei Jia, Qian Chen, Linsheng Gui, Jipeng Jin, Yongyuan Li, Qiaohong Ru, Shengzhen Hou. "Association of polymorphisms in bone morphogenetic protein receptor-1B gene exon-9 with litter size in Dorset, Mongolian, and Small Tail Han ewes", Asian-Australasian Journal of Animal Sciences, 2019

---

55 < 1% match (R. Jabbari Ori, A. K. Esmailizadeh, H. Charati, M. R. Mohammadabadi, S. S. Sohrabi. "Identification of QTL for live weight and growth rate using DNA markers on chromosome 3 in an F2 population of Japanese quail", Molecular Biology Reports, 2014)

R. Jabbari Ori, A. K. Esmailizadeh, H. Charati, M. R. Mohammadabadi, S. S. Sohrabi. "Identification of QTL for live weight and growth rate using DNA markers on chromosome 3 in an F2 population of Japanese quail", Molecular Biology Reports, 2014

---

56 < 1% match (Xinyu Wang, Qing Yang, Ke Wang, Hailong Yan, Chuanying Pan, Hong Chen, Jinwang Liu, Haijing Zhu, Lei Qu, Xianyong Lan. "Two strongly linked single nucleotide polymorphisms (Q320P and V397I) in GDF9 gene are associated with litter size in cashmere goats", Theriogenology, 2019)

Xinyu Wang, Qing Yang, Ke Wang, Hailong Yan, Chuanying Pan, Hong Chen, Jinwang Liu, Haijing Zhu, Lei Qu, Xianyong Lan. "Two strongly linked single nucleotide polymorphisms (Q320P and V397I) in GDF9 gene are associated with litter size in cashmere goats", Theriogenology, 2019

paper text:

Association of FecXG and FecX mutations with Litter Size in Kacang and Boerka Goat Maskur1*, Muhammad Muhsinin1 and Sulaiman Ngongu Depamede2 1Laboratory

> 1**of animal genetics and breeding, Faculty of Animal Science, University of Mataram, Indonesia**; 2Laboratory **of** Biotechnology **Faculty of Animal Science, University of Mataram Abstract The**

Kacang

> 48**goat is one of the** native Indonesian **prolific goat breeds**

, while the Boerka

> 50**goat is a crossbreed between Kacang and** Boer **goats**

. It is well known that the BMP15 (FecXG) and BMPR-1B (FecB) gene mutations significantly affect

> 35**ovulation rate and litter size in sheep** breeds. Based on **this** information, this **study was** designed **to identify**

BMP15 and BMPR-1B gene polymorphisms and their effect on the prolific traits of Kacang and Boerka goats. This study indicates that the FecXG and FecB mutations were

> 22**associated with litter size in** Kacang **and** Boerka **goat breeds. The**

FecXG has two genotypes in both Kacang and Boerka goats, namely homozygote wild type ++ and heterozygote mutant carrier G+ with a litter size of 1.56 and 1.65 (Kacang); 1.61 and 1.75 (Boerka), respectively. Meanwhile, FecB mutations produce three genotypes: homozygote wild type ++, heterozygote mutant carrier B+ and homozygote mutant BB with a litter size of 1.00, 1.37 and 1.65 (Kacang); and 1.00, 1.18 and 1.74 (Boerka), respectively. Keywords: goat, FecXG, FecB, polymorphic and litter size. *

> 4**Correspondence | Maskur, Faculty of Animal Science, University of Mataram, 62 Majapahit Street, Lombok, 81325 West Nusa Tenggara Province, Indonesia; Email: maskur@unram.ac.id** INTRODUCTION In Indonesia, **the**

increase in the goat population is generally related to empowering the economy of rural households, supporting food security, and improving the nutritional quality of families. Goats have great potential to increase rural and urban prosperity due to their ability to adapt well to tropical climates, have better productivity, and can utilize low-quality fiber (Kumar et al., 2016; Ahlawat et al., 2015) so that it can be maintained (effortless and withstand harsh conditions) in a dry land farm. The Kacang goat is one of the native Indonesian goats that have high fertility, with a

> 15**litter size** of **1.56–1.98 kids per birth**

, 52.2% for twins, and 2.6% for triplets (Pamungkas et al., 2009). While the Boerka goat is a hybrid goat resulting from a cross between Kacang and Boer goat. Boerka goats have the potential to be developed as meat-producing goats because of their better growth and meat quality. Boerka goats have a birth weight of 2.6-2.8 kg with a weaning weight of 10-12 kg, while the birth weight of Kacang goats was 1.6-1.8 kg with a

weaning weight of 6-8 kg. Boerka goats also have prolific characteristics, with a litter size of 1.45–1.54 kids per birth (Mahmilia and Elieser, 2008). Prolific traits are reproductive traits that have high economic value in goats, where high litter size can accelerate goat population growth. The tendency to produce twins or triplets in goats and sheep is the same, and this trait is passed on to their offspring. The genetic mechanism of increasing litter size due to the FecB and FecX mutations has been widely reported. However, prolificacy regulation at the gene level is different in sheep and goats. Mutations in the BMP15 gene increase

> 37**granulosa cells**' sensitivity **to FSH**, leading **to accelerated** the **development** of follicular **and** early **ovulation of small follicles**

, thereby increasing ovulation in ewes (Moore and Shimasaki,

> 7**2005). The BMP receptor** (BMPR) **is expressed by oocytes and granulosa cells**

and then

> 10**binds to BMP15. The BMPR-1B gene**

mutation

> 7**has an additive effect on** the **rate** of ovulation (**Pramod et al., 2013**) and increases **the**

ovulation rate by one copy (Guo et al., 2018). As in sheep, the genetics of prolificacy has also been studied extensively in goats. Several studies have shown

> 12**that the BMP15 gene is** also the primary **gene that** regulates **prolificacy**

in goats, such as

> 49**in Jining** Gray **goats (Chu et al., 2007**), Beetal **and**

Teddy goats (Islam et al., 2019), Funiu

> 18**white goats** (Wang **et al., 2011), and** Markhoz **goats** (Ghoreishi **et al**

., 2019). Polymorphism in the BMPR-1B gene was also reported to be associated with prolific traits

> 15**in Black Bengal goats (Polley et al., 2009**), Beetal, **and** Teddy **goats**

(Islam et al., 2019). Contrary,

> 32**Hua et al. (2008) reported** none of **the**

FecB and FecX polymorphism in

> 38**prolific goat breeds such as Boer, Haimen, Huanghuai, Nubi and Matou**

. Based on the abovementioned, the mechanism and regulation pathways of fecundity genes in prolific goats are not clear, so further study is still needed

> 53**in more breeds and a large sample size**

of a goat.

> 40**Litter size is a** reproductive trait with **low heritability in** goats **and is** regulated **by** more than one **gene**

. Therefore, it was crucial to provide scientific information for designing a set of DNA

> 52**markers that** can **be useful** for **marker-assisted selection (MAS**

) in Kacang and Boerka goats. MATERIAL AND METHOD Experimental animals and DNA isolation The total sample was 211 female goats, consisting of 111 Boerka and 100 Kacang goats. All samples were collected at PT. Sadhana Arif Nusa, East Lombok, West Nusa Tenggara, Indonesia. The number of kids for every birth and the average litter size

> 2**of the first three parities** for each ewe **was recorded and used for** association **analysis**

. Blood samples were collected from each animal using a K2EDTA Venoject tube and preserved at -25°C. The Genomic DNA extraction was performed according to the Genomic DNA Mini Kit Geneid procedure. PCR amplification and Genotyping Based on the Ovis aries genbank database (GenBank access code: NC_022322), two pairs of PCR

> 21**primers were designed using Primer 3.0 software and the published nucleotide sequence of the caprine gene**

. The forward and reverse primers for

> 11**exon 2 of BMP15 and exon** 6 **of** BMPR1B **genes**

are presented in table 1. DNA amplification was carried out in the Nexus Mastercycler PCR machine with a 15 µl

> 39**reaction mixture consisting of 1 µl DNA, 0.5 µl Primers**

, 6.25 µl MyTaq HS Red Mix, 2x and 7.25 µl Water (dH2O). Amplification conditions were as follows: pre-denaturation temperature conditions of

> 5**95 oC for 5** minutes, **followed by 35 cycles** for the **denaturation** step **at 95 oC for 10 s, annealing at 60** oC **for 20 s, and** elongation **at 72 oC for 30 s**; with **the final** elongation stage **at 72 oC for 5**

minutes in one cycle. About 5

> 27**µl of each PCR product** were **digested** separately **with** Hinf1 10 **U**

for BMP15 and AvaII 10 U for BMPR-1B at 37 °C overnight. The

> 36**DNA fragments were separated by 2.5% agarose gel electrophoresis and visualized**

in an AlphaImager (Alpha Innotech Corporation, USA). Data analysis The genotypes and alleles frequency, heterozygosity, polymorphism information content, and

> 47**Hardy-Weinberg equilibrium** were examined **using Popgene version 1.31**

software. SNP position determination was corrected to Ensembl's DNA sequence using the MEGA-X program (ENSCHIG00000024611). The association of genotypes with the litter size of Kacang and Boerka goats was

> 29**analyzed using the GLM** (General Linear Model) **procedure** with **SAS 9.1.3 software (SAS Institute, Cary, NC, USA**

).

3**The model applied was: Yiklm** = μ + Ci + **Bk** + (BC)**ik+ Sl + Eiklm Where**, Yiklm **is the trait measured on each of the iklmth** animals; μ **is the overall population mean**; Ci **is the fixed effect** of **the ith** combined **genotype; Bk is the fixed effect** of **the kth breed**; (BC)**ik is the interaction between the ith and the kth**; S1 **is the** fixed **effect** of **the lth sire, and** Eiklm **is the random error**

. RESULT AND DISCUSSION Polymorphism of BMP15 gene in Kacang and Boerka Goat Amplifying the BMP15 gene in Kacang and Boerka goats produced DNA fragments (PCR products) with a length of 141 bp (Figure 1). Mutation

20**of the** BMP15 **gene was** identified **by** the **RFLP method** using **the**

Hinf1 restriction enzyme with the G|ANTC cleavage site (Figure 2). The wild type of the exon 2 BMP15 gene sequence has a cleavage site for the Hinf1 enzyme that produces alleles with sizes of 111 bp and 30 bp (+ allele), respectively. The C/T transition mutation caused a change in the cleavage site of the HinfI enzyme at position 718 (

27**c.718C>T) of the BMP-15 gene**, which resulted **in**

a mutant allele (G allele) with a size of 141 bp. Identification of allele and genotype of the BMP15 gene using the method of RFLP- Hinf1 resulted in

2**two alleles, namely + (wild type) and** G (**mutant** type) **allele with** two **genotypes** ++ (homozygote wild type) **and**

G+ (heterozygote mutant carrier), while the genotype homozygote mutant GG was not identified on Kacang and Boerka goats (Figure 2). The allelic and genotypic frequency distributions indicate

10**a highly** contrasting **difference (P<0.01). The**

+ allele was significantly higher

11**than the G allele, and the genotype ++ was** significantly higher than **the**

G+ in

32**the two goat breeds (Table 2**). The presence **of**

polymorphic sites for

18**exon 2 of the** BMP15 **gene** has **been** published **in several breeds**

of goats, such as Jining Grey (Chu

17**et al**., 2007); **White Goat** of Guizhou (**Ran et al., 2009**); Funiu **white and** Taihang **black (Wang et al., 2011**); Beetal **and** Teddy goats (Islam **et al**

., 2019). In this study, the homozygous mutant GG did not find in the Kacang and Boerka goat population. Similarly, homozygous mutant GG also was not found in several goat breeds, such as Markhoz goats (

19**Ghoreishi et al., 2019**), Teddy goat (Islam **et al., 2019**), Taihang black (Wang **et al**., 2011), **and**

Jining gray (Chu et al., 2007); and some breeds of sheep, such as the

6**Small Tailed Han (Chu et al., 2007**), Belclare (Mullen **et al**., 2013), Barki **and** Rahmani (El- Seedy **et al**

., 2017), six Egyptian sheep breeds (Saleh et al. 2020), and Lombok Fat Tail (Maskur et al., 2016). The Possible reasons need to be explained that no GG ewes were observed in the present study. A tendency towards accumulating and losing certain genotypes could be due to intensive selection. GG ewes may exist in the Kacang and Boerka breeds, but this research used experimental ewes with a litter record, so all infertile ewes were excluded. Another possible reason that GG ewes may not exist in the Kacang and Boerka breeds is that there are no reports of infertility among Kacang and Boerka goats, as in Belclare sheep. Polymorphism of BMPR-1B gene in Kacang and Boerka Goat Amplifying the BMPR-1B gene in Kacang and Boerka goats produced DNA sequences with a length of 140 bp. The

> 54**wild type of** the **BMPR-1B gene exon**

6 sequence has not a cleavage site for the AvaII restriction enzyme, so

> 10**the wild-type** of this **allele is 140 bp**

(+). Mutations at this locus convert

> 2**adenine bases into guanine (A/G transition) at** the **base**

position 746 coding regions of the BMPR-1B gene (c.746A>G). This mutation causes the formation of a cleavage site for the AvaII restriction enzyme (G|GACC), so the digestion produces mutant alleles measuring 110 and 30 bp (B) in length. Identification of allele and genotype

> 10**of the BMPR-1B gene** using **the**

method of RFLP- AvaII resulted in two alleles, namely mutant B (110 bp and 30 bp) and wild + allele (140 bp), with three genotypes ++ (homozygote wild type), B+ (heterozygote mutant carrier), and BB (homozygote mutant) (Figure 4). The allelic and genotypic frequency distributions indicate a highly contrasting difference (

> 14**P<0.01). The** frequency **of the** wild + allele **was significantly higher than**

the mutant B allele, and the genotypic ++ was significantly higher than B+ and BB in the two goats breed (Table 3). However, the previous research in several sheep breeds indicates the abundance of mutant alleles compared to wild alleles, such as in prolific

> 6**Garole sheep (Polley et al., 2010**); Indonesian fat-tailed **sheep** (Maskur **et al**., 2016); **Small**-Tail **Han (Chu et al., 2007**; Wen **et al**., 2021); **and** Bayanbulak sheep (Zuo **et al**

., 2013). Similar to this study,

> 16**the FecB mutation has been** previously found **in** several **goat breeds**

, such as

> 11**Black Bengal (Polley et al., 2009**), Markhoz (**Shokrollahi and Morammazi, 2018**

), Beetal and Teddy goats (Islam et al., 2019). In contrast, in some other goat breeds, it has not been found, such as the Rayini goats of Iran (

> 42**Gazooei et al., 2013**), the prolific **Raighar (Palai et al., 2013**

), the Indian Berari and Surti goat (Sharma et al. 2016; Dangar et al., 2019), and some Egypt

> 8**sheep breeds** (Abulyazid **et al**., 2011; **El**-Seedy **et al**., 2017; Saleh **et al**

., 2020). The possible reasons for the differences between the results obtained from different breeds may be due to: (1) the accumulation of certain genotypes and alleles as a result of intensive selection, (2) the

possibility of inbreeding, and (3) the possibility of previous genes introgression as a breeding strategy. Genetic Diversity Within the Goat Breeds The genetic index describes a population's genetic diversity by

> 28**the number of alleles, observed heterozygosity (Ho), expected heterozygosity (He), and Polymorphic Information Content (PIC) values**

as basic

> 1**information for individual and population discrimination (Seo et al., 2016**

). Data in table 4 indicate a genotypic imbalance in the two goat populations where the observed heterozygosity was significantly different from the Hardy-Weinberg expectation agreement. In this study, the low level of Ho and He value revealed low genetic diversity in the two goat populations. The occurrence of heterozygosity deficits in the population is caused by selection pressure at certain loci and inbreeding. The PIC value of exon 2

> 24**of the BMP15 gene in** both Kacang **and** Boerka **goat breeds was**

0.211 and 0.221, while exon 6 of BMPR1B was 0.170 and 131, respectively. Base on

> 1**Bolstein et al. (1980), the PIC** level classified **as highly (PIC > 0.50), reasonably** (0.50 > PIC > **0**.25), and slightly (**PIC < 0.25) informative. Thus**

, in recent research, the PIC value in both BMP15 and BMPR1B was classified as

> 55**slightly informative (PIC < 0.25**). Association **of The**

FecXG and FecB mutations with

> 41**Litter Size in the** Goat Breeds **The** FecXG (**c**.718C>**T) and** FecB (**c**.746A>G) **mutations**

were investigated as potential gene candidates for prolificacy in Indonesian Kacang and Boerka goats. The mutations

> 7**and their effect on ovulation** rates **and**/or **litter size** were initially found **in sheep**

and subsequently identified in other species, such as goats.

> 16**On the other side**, several **previous investigations in different breeds of**

sheep and goats found no FecB and FecXG mutations and/or

> 19**their association with litter size. The** influence **of The**

FecXG (c.718C>T) mutation on goat litter size is apparent from the data of this study (Table 5). We found two genotypes in both goat breeds, namely homozygote wild type ++ and heterozygote carrier G+, in which the G+ had a higher number of kids than the ++ genotype. These findings are similar to the previous study

> 23**in Jining Grey goats**, in which **the** heterozygote carrier **AB had 1.13 kids more than the** homozygote **AA**

0.01) (Chu et al., 2007). Conversely, some other researchers observed that the homozygote mutant goats

> 43**had the highest number of kids, followed by the**

heterozygote carrier and homozygote wild-types, such as Beetal and Teddy goats (Islam et al., 2019), Anglo-Nubian (Abdel-Rahman et al., 2013), Funiu white and Taihang black (Wang et al., 2011). In sheep breeds, some previous studies also confirmed the heterozygote carrier genotype for BMP-15

46had a higher litter size than the homozygote wild-type

,

30such as in Small Tailed Han (Chu et al., 2007; Zhang et al., 2011), Chios (Liandris et al., 2012), Rahmani and

Rahmani x Barki Cross (Saleh et al., 2020). In contrast, several other studies found that the homozygote wild type had a higher litter size than the heterozygote carrier. Meanwhile, homozygote carrier sheep for this mutation were infertile. Mc Natty et al. (2005) state that FecXG mutation causes premature stop codon at amino acid residue 239 (CAG -->TAG, Q239Ter), resulting in immature protein, which may result in loss of BMP15 function. The relationship between BMP15 mutations and ovulation rates is based on the concept that the rate of ovulation will increase if the expression of the BMP15 gene is lower, but if the level of BMP15 is too low, it will cause total dysfunction (Fabre et al., 2006). The importent role of BMP15

13in regulating ovulation rates and/or litter size in sheep

and goats was supported by several previous studies. The BMP15 gene expression in the prolific goat ovary

45was significantly (P<0.05) higher than in

9non-prolific goats (Yang et al., 2012; Pramod et al., 2013

; Pan et al., 2015). However, in Booroola Romney sheep,

26the expression of the BMP15 gene in the oocytes of prolific was lower than

51in wild animals (Crawford et al., 2011). This suggests that BMP15

plays

34a different role in sheep and

goats and

13might regulate the ovulation rate and fertility of females in a species-specific manner (Al- Musawi

34et al., 2013). In the present study

, we observed a negative relationship between FecB mutation (A746G or Q249R) and Litter Size (LS) in prolific Kacang and Boerka goats (Table 5). The Litter Size of the wild-type ++ goats was greater than carrier B+ and mutant BB goats. Polley et al. (2009) found a positive effect of FecB mutation on Black Bengal goat in which the genotypes of homozygote wild type, heterozygote carrier and homozygote mutant had litter sizes 2.7, 3.04 and 3.11, respectively. However, some previous studies showed the FecB mutation had low polymorphism and no association with

8litter size in Jining Grey, Boer, Anhui White, Wendeng Dairy, Liaoning Cashmere

, Barbari, Malabari, Osmanabadi, and Ganjam goats (Ahlawat

9et al., 2014; Chu et al., 2010). The different genetic effects of

these mutations are possibly caused by the intense selection pressure on the population resulting in the accumulation of certain genotypes.

12**This In turn would affect the effective population size** in **the** goat genotype group **and** will have an **impact** on **the** results **of the** significant **association**

analysis. Another possible reason is that the BMPR-1B gene expression may vary between breeds and environmental conditions or due to the interactions between breeds and the environment (Fogerty, 2008). In sheep breeds, some researchers have confirmed that

14**the FecB mutation has an effect on ovulation** rate **and**/or **litter**

sizes, such as Dorset, Mongolian,

31**Small-Tail Han**, Hu **and Bayanbulak sheep (China**: Jia **et al**., 2019; Wen **et al**., 2021; Wang **et al**

., 2018; Zuo et al., 2013); Garole, Nilagiri, Nellore and Deccani sheep (India: Polley

33**et al., 2010**; Praveena **et al**., 2017; Chaudhari **et al., 2019**); Mehraban and **Kalehkoohi (Iran**: Abdoli **et al**

.,

9**2013**; Talebi **et al**., 2018; Mahdavi **et al., 2014). The** important role **of**

FecB mutations in the regulation of sheep reproduction has been confirmed in several previous studies. The FecB mutation reduces the BMPR-IB inhibitory effect on granulosa cell steroidogenesis so that they

2**are more sensitive to FSH; thus, the** cell division becomes **more** active, **leading to**

the maturation and ovulation of multiple ovarian follicles (Fabre et al., 2006). The basic concept of the prolific nature is that an increased ovulation rate leads to a more significant

2**number of ovulated oocytes and if fertilization occurs and**

the parent is able to maintain a viable embryo,

2**it will be followed by the birth of more than one** kid (**Wilson et al., 2001). CONCLUSION**

According to these results, we can state that BMP15 and BMPR1B gene was polymorphic and significantly affected on litter size in Kacang and Boerka goats.

25**The results of this study** will hopefully **provide a basis for the development of**

56**marker-assisted selection (MAS) for** goat **breeding** programs **in**

the future. However, our study has limitations on the effective population size of each genotype group in the test goats, which will impact the association analysis results. Therefore, further investigations

44**on a** large **number of animals** and balanced populations **are needed to**

confirm the association of BMP15 and BMPR1B genes with increased prolificacy in Kacang and Boerka goats. Acknowledgment The University of Mataram Research Grant funded this research with contract number: 2832/UN18.L1/PP2020. The greatest appreciation to the Rector of the

1**University of Mataram for the support** of this **research**. Novelty Statement **The**

Vet. Puslitbangnak Deptan, Bogor, Hal. 391- 394. Maskur M, Tapaul R, Kasip L (2016). Genetic polymorphism of bone morphogenetic protein receptor 1B (BMPR-1B) gene and its association with litter size in Indonesian fat-Tailed sheep. African J. Biotech., 15(25): 1315-1319. Mc Natty KP, Juengel JL, Reader KL, Lun S, Myllymaa S, Lawrence SB (2005). Bone morphogenetic protein 15 and growth di_erentiation factor 9 cooperate to regulate granulosa cell function in ruminants. Reproduction. 129: 481–487. [CrossRef] [PubMed] Moore RK and Shimasaki S (2005). Molecular biology and physiological role of the oocyte factor, BMP-15. Mol. Cell.Endocrinol. 234: 67-73. Mullen MPHJ, Howard DJ, Powell R (2013). Investigation of prolific sheep from UK and Ireland for evidence on origin of the mutations in BMP15 (FecXG, FecXB) and GDF9 (FecGH) in Belclare and Cambridge sheep. PLoS ONE. 8. Palai TK, Bisoi PC, Maity A, Behera PC, Sahoo G, Polley S, De S (2013). Prolificacy in Raighar goats is independent of FecB gene. Veterinary World, 6: 479-481. Pamungkas FA, Batubara A, Doloksaribu M, Sihite E (2009). Petunjuk Teknis Potensi Beberapa Plasma Nutfah Kambing Indonesia. Puslitbangnak, Deli Serdang, Sumatera Utara. Pan ZY, Di R, Tang QQ, Jin HH, Chu MX, Huang DW, He JN, Liu QY, Hu WP, Wang XY (2015). Tissue-specific mRNA expression profiles of GDF9, BMP15, and BMPR1B genes in prolific and non-prolific goat breeds. Czech J. Anim. Sci., 60: 452–458. [CrossRef] Polley S, De S, Batabyal S, Kaushik R, Yadav P, Arora JS, Chattopadhyay S, Pan S, Brahma B, Datta TK, Goswami SL (2009). Polymorphism of fecundity genes (BMPR1B, BMP15 and GDF9) in the Indian prolific Black Bengal goat. Small Ruminant Res 85:122–129. [CrossRef] Polley S, De S, Brahma B, Mukherjee A, Vinesh PV, Batabyal S, Arora JS, Pan S, Samanta AK, Datta TK, Goswami SL (2010). Polymorphism of BMPR1B, BMP15 and GDF9 fecundity genes in prolific Garole sheep. Trop. Anim. Health Prod. 42: 985-993. Pramod RK, Sharma SK, Singhi A, Pan S, Mitra A (2013). Differential ovarian morphometry and follicular expression of BMP15, GDF9 and BMPR1B influence the prolificacy in goat. Reprod. Domes. Anim., 48, 803-809. Praveena K, Ramana DBV, Pankaj PK (2017). Booroola Gene (FecB) Polymorphism and its liaison with litter size in indigenous sheep breeds of Telangana, India. J Anim Res., 7:227-31. Ran XQ, Lin JB, Du ZY, Qing C, Wang Jf (2009). Diversity of Bmp15 and Gdf9 genes in White Goat of Guizhou province and evolution of the en-coded proteins. Zoological Research, 30: 593-602. Saleh A, Hammoud M, Dabour N, Hafez E, Sharaby M (2020). BMPR-1B, BMP-15 and GDF-9 genes structure and their relationship with litter size in six sheep breeds reared in Egypt. BMC Res. Notes 13, 215. [CrossRef] [PubMed] Seo D, Bhuiyan MSA, Sultana H, Heo JM, Lee JH (2016). Genetic divesity analysis of South and East Asian duck populations using highly polymorphic microsatellite markers. Asian Aust. J. Anim. Sci., 29: 471-478. https://doi. org/10.5713/ajas.15.0915 Sharma L, Kuralkar SV, Sajid Ali S, Bankar PS, Prajakta K (2016). Polymorphism Study of BMPR-1B and BMP-15 Genes in Berari Goats. Ind.J.of Small Rum. 22(2): 230-233 Shokrollahi B and Morammazi S (2018). Polymorphism of GDF9 and BMPR1B genes and their association with litter size in Markhoz goats. Reprod. Domest. Anim., 53: 971–978. [CrossRef] Talebi R, Ahmadi A, Afraz F, Sarry J, Woloszyn F, Fabre S (2018). Detection of single nucleotide polymorphisms at prolificacy major genes in the Mehraban sheep and association with litter size. Ann. Anim. Sci., 18(5): 685-698. Wang W, La Y, Zhou X, Zhang X, Li F, Liu B (2018). The genetic polymorphisms of TGFβ superfamily genes are associated with litter size in a Chinese indigenous sheep breed (Hu sheep). Anim. Reprod. Sci., 189: 19-29. Wang Y, Li Y, Zhang N, Wang Z, Bai J (2011). Polymorphism of Exon 2 of BMP15 Gene and Its Relationship with Litter Size of Two Chinese Goats. Asian-Aust. J. Anim. Sci., 24(7):905-911 Wen YL, Guo XF, Ma L, Zhang XS, Zhang JL, Zhao SG, Chu MX (2021). The expression and mutation of BMPR1B and its association with litter size in small-tail Han sheep (Ovis aries), Arch. Anim. Breed., 64: 211–221, https://doi.org/10.5194/aab-64-211-2021 Wilson T, Wu XY, Juengel JL, Ross IK, Lumsden JM, Lord EA, Dodds KG, Walling GA, McEwan JC, O'Connell AR, McNatty KP, Montgomery GW (2001). Highly prolific Booroola sheep have a mutation in the intracellular kinase domain of bone morphogenetic protein IB receptor (ALK-6) that is expressed in both oocytes and granulosa cells. Biol. Repr., 64:1225–1235. Yang CX, Zi XD, Wang Y, Yang DQ, Ma L, Lu JY, Niu HR, Xiao XL (2012), Cloning and mRNA expression levels of GDF9, BMP15, and BMPR1B genes in prolific and non-prolific goat breeds. Mol. Reprod. Dev., 79(1): 2. doi:10.1002/mrd.21386 Zhang CS, Geng LY, Du LX, Liu ZZ, Fu ZX, Feng MS, Gong YF (2011). Polymorphic Study of FecX , G FecG and FecB mutations in four domestic sheep breeds in the lower yellow river valley of China. H J. Anim. Vet. Adv., 10(17): 2198- 2201. Zuo B, Hongguang Q, Ziyu W, Xu W, Noor N, Aierdin B, Shijia Y, Xiaolong H, Changhai G, Zhiqin G, Feng W (2013). A Study on BMPR-IB Genes of Bayanbulak Sheep. Asian-Aust. J. Anim. Sci., 26(1): 36-42. 1 2 3 4 5 6 7 8 9 10 11

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your Manuscript ID: MH20221008051025 has been assigned an Editor

1 pesan

Manuscript Handler <info@manuscripthandler.com> 17 Oktober 2022 pukul 23.12
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <journals@researcherslinks.com>
Kepada: maskur@unram.ac.id

Dear Dr Maskur Maskur,

Your Manuscript ID MH20221008051025 with title "Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat" has passed the initially quality checks and is now transferred to the Editor of the journal to be considered for review process.

This is a standard procedure for all the new and revised submissions. The editor will evaluate/assess your manuscript and either will proceed to a decision or send it for a review. This email is for your information only and there is nothing for you to do at this moment. We will keep you updated with further information.

Regards,
Researcherslinks

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com
journals@researcherslinks.com

Turnitin_Originality_Report_1927674388.html
80K

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your Manuscript in Advances in Animal and Veterinary Sciences is awaiting Editor's decision

1 pesan

Manuscript Handler <info@manuscripthandler.com> 10 November 2022 pukul 14.07
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <journals@researcherslinks.com>
Kepada: maskur@unram.ac.id

Dear Dr Maskur Maskur,

We have received reviewer's reports or editor's assessments for your Manuscript ID MH20221008051025 with title Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat in Advances in Animal and Veterinary Sciences.

The manuscript is with Editor to make final decision.

This decision may take some time as it is being discussed with the Editorial Board members. Not hearing the decision on your manuscirpt indicates that the decision is not yet agreed. As soon as the decision is committed, you will be informed.

This email is for your information only and there is nothing for you to do at this moment. We will keep you updated with further information.

Regards,

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your Manuscript in Advances in Animal and Veterinary Sciences has been assigned Reviewers

1 pesan

Manuscript Handler <info@manuscripthandler.com> 18 Oktober 2022 pukul 02.17
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <journals@researcherslinks.com>
Kepada: maskur@unram.ac.id

Dear Dr Maskur Maskur,

Your Manuscript ID MH20221008051025 with title Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat has been assigned reviewers. We will try our best to have reviewer's feedback at their earliest possible and to reduce the time from submission to publication. However, please note that some reviewers take longer time than anticipated which overall effect the peer-review time. We would appreciate your patience in this matter.

This email is for your information only and there is nothing for you to do at this moment. We will keep you updated with further information.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to https://www.manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences

Regards,
Researcherslinks

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com
journals@researcherslinks.com

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Researcherslinks: Decision on Manuscript ID MH20221008051025

2 pesan

Manuscript Handler <info@manuscripthandler.com> 10 November 2022 pukul 14.07
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <mohammedvet1986@gmail.com>
Kepada: maskur@unram.ac.id
Cc: researcherslinks@gmail.com

Thu, 10 Nov 2022, 06:07 AM

Dear Dr. Maskur Maskur,

We have received the reports from our reviewers on your manuscript, "Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat", which you submitted to Advances in Animal and Veterinary Sciences with MH20221008051025.

Based on the received comments, your manuscript could be reconsidered for publication, should you be prepared to incorporate Minor Revisions.

The comments and requests of the Editor and the Peer Reviewers are included below. Please share this information with all coauthors of the manuscript.

Editor's Comments:

• Review the peer review comments and requests carefully, and edit the manuscript accordingly.

• Include a separate point-by-point response file addressing the reviewers comments along with an explanation of any request of the editor or the reviewers that you do not address in your revised manuscript. Your list of responses should be uploaded as a Cover Letter in addition to your revised manuscript.

• Please colour (e.g. red in contrast to black text) all changes in the revised manuscript, without such coloured changes the manuscript may be returned or rejected.

• Verify the placement and accuracy of each reference in your manuscript as well as the accuracy of all of the values in your tables and figures.

• Please ensure that all author’s names and their affiliations are placed correctly.

• Make every effort to address the remaining concerns and to resubmit your manuscript. If you anticipate an additional delay, or if you do not wish to resubmit your manuscript, then please notify us as soon as possible.

• Please keep your coauthors apprised of the status of the article throughout the revision process.

Please feel free to contact the Manuscript Handler coordinators if you have any questions regarding the submission process: info@manuscripthandler.com or +441252516907 (UK)

Your can login to your Author’s Panel within 15 days to revise the manuscript.

Please submit your revised draft online. We do not process email attachment.

https://www.manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences/login

Username: maskur@unram.ac.id
Password: courelio68

Go to "Submission needing revision ". Scroll down the page and select  beneath "Action" and then "File update". Here you can upload the revised files of your manuscript.

We look forward to receiving your revised manuscript.

Sincerely,
Editorial Office

ResearchersLinks, Ltd

35 Oxford Road,

Burnley, Lancashire

BB11 3BB

United Kingdom

Email: journals@researcherslinks.com

Tel: +44 (0)1524383621

+44 (0)7733040586

Twitter: @ResearchersLinks

Facebook: https://www.facebook.com/researchers.links.1

LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478

Web: www.researcherslinks.com
Email: journals@researcherslinks.com
Web:

Reviewer(s) Comments to Author:

Comments to the Author

1.The word association in the title should be replaced with the word identification
2.The manuscript require Extensive English editing by native language speaker.

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id> 15 November 2022 pukul 09.40
Kepada: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <mohammedvet1986@gmail.com>

Dear Editorial office,
I've logged in to the author panel and downloaded the manuscript file but I can't find the peer review comments on my manuscript.
Thus, I will follow up on the reviewer's comments to revise the title and edit the manuscript by native language speakers.

Sincerely,
Maskur

[Kutipan teks disembunyikan]

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Researcherslinks: Decision on Manuscript ID MH20221008051025-R1

5 pesan

Manuscript Handler <info@manuscripthandler.com> 3 Desember 2022 pukul 03.53
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <mohammedvet1986@gmail.com>
Kepada: maskur@unram.ac.id
Cc: researcherslinks@gmail.com

Fri, 02 Dec 2022, 07:52 PM

Dear Dr. Maskur Maskur,

It is a pleasure to accept your manuscript entitled "Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat" in its current form for publication in the Advances in Animal and Veterinary Sciences.

Your article is now being processed for formatting, copy editing and final publication. You will be informed for each step and we will contact you when we need any further information or material.

Thank you for your fine contribution. On behalf of the Editors of the Advances in Animal and Veterinary Sciences, we look forward to your continued contributions to the Journal.

Sincerely,
Editorial Office

ResearchersLinks, Ltd

35 Oxford Road,

Burnley, Lancashire

BB11 3BB

United Kingdom

Email: journals@researcherslinks.com

Tel: +44 (0)1524383621

+44 (0)7733040586

Twitter: @ResearchersLinks

Facebook: https://www.facebook.com/researchers.links.1

LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478

Web: www.researcherslinks.com
Email: journals@researcherslinks.com
Web:

Reviewer(s) Comments to Author:

Researchers Links <researcherslinks@gmail.com> 6 Desember 2022 pukul 20.22
Cc: maskur@unram.ac.id

Dear Author,

Thank you very much for your contribution in Advances in Animal and Veterinary Sciences (AAVS). The journal has recently collaborated with a UK based publisher called ResearchersLinks Ltd, to advance our contents for global

distribution. Therefore, the article will be published at www.ResearchersLinks.com. If you have any questions please feel free to contact us.

You are requested to pay **300 USD** using one of the options mentioned below and send the proof at journals@researcherslinks.com and write manuscript ID in the subject line of the email. We'll send you galley proof once the charges are received.

1. Credit card transfer via PayPal (most preferred)
Pay using PayPal at the email address mentioned below and write manuscript ID in the description.
https://www.paypal.com/paypalme/ResearchersLinks

2. Online Payment

You can pay online using a credit card in our secure online portal. Please write manuscript ID in the form:
http://researcherslinks.com/payments

In case any of the above mentioned option is not feasible, please let us know.

Thank you for your fine contribution. On behalf of the Editors of the AAVS, we look forward to your continued contributions to the Journal.

Your earliest possible response will highly be appreciated.

Regards,

Editorial Office
ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

[Kutipan teks disembunyikan]

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id> 13 Desember 2022 pukul 13.27
Kepada: Researchers Links <researcherslinks@gmail.com>

Paid. Dear User,
Thanks for making the payment. Your payment has been successful. You can send this payment record to the publishing office on the same email address from where you have received the invoice. We will then proceed to the next step of publication.

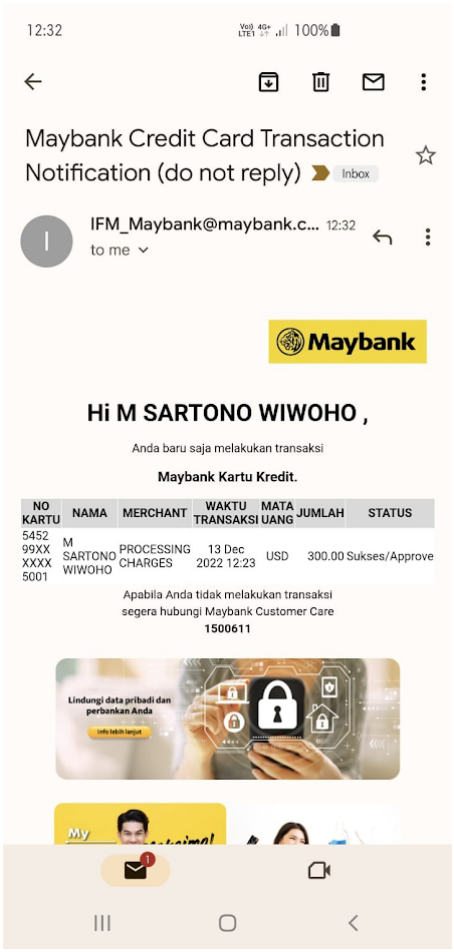
Looking forward hearing from you soon.

Regards,
Researchers Links

[Kutipan teks disembunyikan]

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id> 13 Desember 2022 pukul 13.42
Kepada: Researchers Links <researcherslinks@gmail.com>

Dear editorial office
I have paid a fee of 300 US for articles with Manuscript ID MH20221008051025-R1 (proof attached)



Best regards

Maskur

Pada tanggal Sel, 6 Des 2022 pukul 20.22 Researchers Links <researcherslinks@gmail.com> menulis:
[Kutipan teks disembunyikan]

Researchers Links <researcherslinks@gmail.com> 13 Desember 2022 pukul 14.25
Kepada: "Dr. Ir. Maskur M.Si." <maskur@unram.ac.id>

Dear Author,

Thank you for paying the publication charges. We are now composing your article and will send you galley proof soon.

Regards,

Editorial Office
ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

[Kutipan teks disembunyikan]

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your Manuscript ID: MH20221008051025-R1 has been assigned an Editor

1 pesan

Manuscript Handler <info@manuscripthandler.com> 23 November 2022 pukul 18.07
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <journals@researcherslinks.com>
Kepada: maskur@unram.ac.id

Dear Dr Maskur Maskur,

Your Manuscript ID MH20221008051025-R1 with title "Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat" has passed the initially quality checks and is now transferred to the Editor of the journal to be considered for review process.

This is a standard procedure for all the new and revised submissions. The editor will evaluate/assess your manuscript and either will proceed to a decision or send it for a review. This email is for your information only and there is nothing for you to do at this moment. We will keep you updated with further information.

Regards,
Researcherslinks

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com
journals@researcherslinks.com

Turnitin_Originality_Report_1961953221.html
256K

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Manuscript MH20221008051025-R1 is submitted to Journal Advances in Animal and Veterinary Sciences

1 pesan

Manuscript Handler <info@manuscripthandler.com> 21 November 2022 pukul 10.41
Balas Ke: Manuscript Handler <info@manuscripthandler.com>
Kepada: maskur@unram.ac.id
Cc: journals@researcherslinks.com

Dear Maskur Maskur,

Your manuscript entitled "Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat" has been successfully submitted online and is presently being given full consideration for publication in the Advances in Animal and Veterinary Sciences.

Your manuscript ID is MH20221008051025-R1

Please mention the above manuscript ID in all future correspondence or when calling the office for questions. If there are any changes in your street address or e-mail address, please log in at https://www.manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences and edit your user information as appropriate.

You can also view the status of your manuscript at any time by checking your Author Center after logging in to https://www.manuscripthandler.com/researcherslinks/Advances-in-Animal-and-Veterinary-Sciences .

Thank you for submitting your manuscript to the Advances in Animal and Veterinary Sciences.

Sincerely,

Editorial Office

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

Turnitin Originality Report

Processed on: 23-Nov-2022 14:49 PKT
ID: 1961953221
Word Count: 5083
Submitted: 1

V: Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat By R L

2% match (Internet from 05-Mar-2022)

Similarity Index	Similarity by Source	
23%	Internet Sources:	17%
	Publications:	19%
	Student Papers:	2%

http://researcherslinks.com/current-issues/Microsatellites-and-Morphometric-Diversity-Among-Indonesian-Local-Duck-Populations-in-Lombok-Island/33/1/4757/html

1% match (Internet from 25-Sep-2022)
https://academicjournals.org/ebook/journal1466089789_AJB%2022%20June%202016%20E-book.pdf

1% match (Internet from 09-Mar-2022)
https://www.researcherslinks.com/current-issues/Microsatellites-and-Morphometric-Diversity-Among-Indonesian-Local-Duck-Populations-in-Lombok-Island/33/1/4757

1% match (Internet from 06-Oct-2021)
http://www.researcherslinks.com/current-issues/Expression-Analysis-of-BMPR1B-BMP15-GDF9/20/1/2903/html

1% match (Internet from 27-Dec-2021)
http://library.cvasu.ac.bd:8080/bitstream/handle/123456789/1369/Introduction%20to%20Reference.pdf?sequence=5

1% match (Internet from 22-Sep-2022)
https://aab.copernicus.org/articles/64/211/2021/

1% match (Internet from 27-Jul-2018)
http://etheses.whiterose.ac.uk/11871/1/Lutz_S_Earth%26Environment_PhD_2015.pdf

1% match (Rosa B López-Ramírez, Héctor F Magaña-Sevilla, Roberto Zamora-Bustillos, Julio P Ramón-Ugalde, Daniel González-Mendoza. "ANALYSIS OF THE 3´ END REGIONS OF THE GDF9 AND BMPR1B GENES IN BLACKBELLY SHEEP FROM YUCATÁN, MEXICO", Ciencia e investigación agraria, 2014)
Rosa B López-Ramírez, Héctor F Magaña-Sevilla, Roberto Zamora-Bustillos, Julio P Ramón-Ugalde, Daniel González-Mendoza. "ANALYSIS OF THE 3´ END REGIONS OF THE GDF9 AND BMPR1B GENES IN BLACKBELLY SHEEP FROM YUCATÁN, MEXICO", Ciencia e investigación agraria, 2014

1% match ()
Islam, M, Basheer, A, Javed, K, Anjum, A.A., Zahoor, I. "PCR-RFLP-based identification of polymorphisms in BMPR1B, GDF9 and BMP15 genes associated with litter size in Beetal and Teddy goats", 'African Journals Online (AJOL)', 2019

1% match (Satish Kumar, Pradeep Kumar Rajput, Sangharatna V. Bahire, Basanti Jyotsana, Vijay Kumar, Davendra Kumar. "Differential expression of BMP/SMAD signaling and ovarian-associated genes in the granulosa cells of FecB introgressed GMM sheep", Systems Biology in Reproductive Medicine, 2020)
Satish Kumar, Pradeep Kumar Rajput, Sangharatna V. Bahire, Basanti Jyotsana, Vijay Kumar, Davendra Kumar. "Differential expression of BMP/SMAD signaling and ovarian-associated genes in the granulosa cells of FecB introgressed GMM sheep", Systems Biology in Reproductive Medicine, 2020

1% match (An, X. P., J. X. Hou, H. B. Zhao, G. Li, L. Bai, J. Y. Peng, Q. M Yan, Y. X. Song, J. G. Wang, and B. Y. Cao. "Polymorphism identification in goat *GNRH1* and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.)
An, X. P., J. X. Hou, H. B. Zhao, G. Li, L. Bai, J. Y. Peng, Q. M Yan, Y. X. Song, J. G. Wang, and B. Y. Cao. "Polymorphism identification in goat *GNRH1* and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.

1% match (Internet from 23-Nov-2019)
https://www.tandfonline.com/doi/full/10.1080/10495390701331114

1% match (Internet from 08-Oct-2022)
http://www.aensiweb.net/AENSIWEB/rjavs/rjavs/2018/january/1-5(1).pdf

---

< 1% match (Internet from 24-May-2022)
https://aab.copernicus.org/articles/65/105/2022/aab-65-105-2022-relations.html

---

< 1% match (Wang, Weimin, Shijia Liu, Fadi Li, Xiangyu Pan, Chong Li, Xiaoxue Zhang, Youji Ma, Yongfu La, Rui Xi, and Tingfu Li. "Polymorphisms of the Ovine BMPR-IB, BMP-15 and FSHR and Their Associations with Litter Size in Two Chinese Indigenous Sheep Breeds", International Journal of Molecular Sciences, 2015.)
Wang, Weimin, Shijia Liu, Fadi Li, Xiangyu Pan, Chong Li, Xiaoxue Zhang, Youji Ma, Yongfu La, Rui Xi, and Tingfu Li. "Polymorphisms of the Ovine BMPR-IB, BMP-15 and FSHR and Their Associations with Litter Size in Two Chinese Indigenous Sheep Breeds", International Journal of Molecular Sciences, 2015.

< 1% match (Internet from 17-Jul-2022)
https://www.researchgate.net/publication/7249782_Polymorphism_of_FecB_Gene_in_Nine_Sheep_Breeds_or_Strains_and_Its_Effects_on_Litter_Size_Lamb_Growth_and_Development

---

< 1% match (Internet from 02-Oct-2020)
https://pubs.rsc.org/en/content/articlehtml/2017/nj/c7nj00560a

---

< 1% match (Internet from 20-Oct-2022)
https://www.frontiersin.org/articles/10.3389/fmicb.2020.01804/full

---

< 1% match (Internet from 27-Oct-2021)
https://www.frontiersin.org/articles/10.3389/fvets.2020.00406/full

---

< 1% match (Internet from 25-Feb-2021)

http://ijas.iaurasht.ac.ir/article_673212.html?_action=article&_au=S.Z.++Mirhoseini&au=520114

< 1% match (Koray Çelikeloğlu, Mustafa Tekerli, Metin Erdoğan, Serdar Koçak, Özlem Hacan, Zehra Bozkurt. "An investigation of the effects of BMPR1B, BMP15, and GDF9 genes on litter size in Ramlıç and Dağlıç sheep", Archives Animal Breeding, 2021)

Koray Çelikeloğlu, Mustafa Tekerli, Metin Erdoğan, Serdar Koçak, Özlem Hacan, Zehra Bozkurt. "An investigation of the effects of BMPR1B, BMP15, and GDF9 genes on litter size in Ramlıç and Dağlıç sheep", Archives Animal Breeding, 2021

< 1% match (M Maskur, R Tapaul, L Kasip. "Genetic polymorphism of bone morphogenetic protein receptor 1B (BMPR-1B) gene and its association with litter size in Indonesian fat-tailed sheep", African Journal of Biotechnology, 2016)

M Maskur, R Tapaul, L Kasip. "Genetic polymorphism of bone morphogenetic protein receptor 1B (BMPR-1B) gene and its association with litter size in Indonesian fat-tailed sheep", African Journal of Biotechnology, 2016

< 1% match (Maskur, Rodiah, and Chairussyuhur Arman. "Association of a Novel Single Nucleotide Polymorphism in Growth Hormone Receptor Gene with Production Traits in Bali Cattle", Italian Journal of Animal Science, 2014.)

Maskur, Rodiah, and Chairussyuhur Arman. "Association of a Novel Single Nucleotide Polymorphism in Growth Hormone Receptor Gene with Production Traits in Bali Cattle", Italian Journal of Animal Science, 2014.

< 1% match (Internet from 07-Jan-2010)

http://www.annclinlabsci.org/cgi/content/full/33/4/429

< 1% match (Elisha Gootwine. "Invited Review: Opportunities for Genetic Improvement toward Higher Prolificacy in Sheep", Small Ruminant Research, 2020)

Elisha Gootwine. "Invited Review: Opportunities for Genetic Improvement toward Higher Prolificacy in Sheep", Small Ruminant Research, 2020

< 1% match (Yinxia Li, Wenwen Jin, Yue Wang, Jun Zhang, Chunhua Meng, Huili Wang, Yong Qian, Qifa Li, Shaoxian Cao. " Three Complete Linkage SNPs of Gene Affect the Litter Size Probably Mediated by OCT1 in Hu Sheep ", DNA and Cell Biology, 2020)

Yinxia Li, Wenwen Jin, Yue Wang, Jun Zhang, Chunhua Meng, Huili Wang, Yong Qian, Qifa Li, Shaoxian Cao. " Three Complete Linkage SNPs of Gene Affect the Litter Size Probably Mediated by OCT1 in Hu Sheep ", DNA and Cell Biology, 2020

< 1% match ("Detection of polymorphisms of growth differentiation factor 9 (GDF9) gene in Indonesian goats", Journal of Animal Breeding and Genomics, 2019)

"Detection of polymorphisms of growth differentiation factor 9 (GDF9) gene in Indonesian goats", Journal of Animal Breeding and Genomics, 2019

< 1% match (C. Glister. "Bone morphogenetic protein (BMP) ligands and receptors in bovine ovarian follicle cells: actions of BMP-4, -6 and -7 on granulosa cells and differential modulation of Smad-1 phosphorylation by follistatin", Reproduction, 02/01/2004)

C. Glister. "Bone morphogenetic protein (BMP) ligands and receptors in bovine ovarian follicle cells: actions of BMP-4, -6 and -7 on granulosa cells and differential modulation of Smad-1 phosphorylation by follistatin", Reproduction, 02/01/2004

< 1% match (Internet from 16-Mar-2016)

http://agriculturejournals.cz/publicFiles/165664.pdf

< 1% match (Ji-Shun Tang, Wen-Ping Hu, Ran Di, Xiang-Yu Wang, Xiao-Sheng Zhang, Jin-Long Zhang, Qiu-Yue Liu, Ming-Xing Chu. "Expression analysis of BMPR1B, BMP15, and GDF9 in prolific and non-prolific sheep breeds during the follicular phase", Czech Journal of Animal Science, 2019)
Ji-Shun Tang, Wen-Ping Hu, Ran Di, Xiang-Yu Wang, Xiao-Sheng Zhang, Jin-Long Zhang, Qiu-Yue Liu, Ming-Xing Chu. "Expression analysis of BMPR1B, BMP15, and GDF9 in prolific and non-prolific sheep breeds during the follicular phase", Czech Journal of Animal Science, 2019

< 1% match (Lin Ma, Qiaomei Qin, Qing Yang, Meng Zhang, Haiyu Zhao, Chuanying Pan, Chuzhao Lei, Hong Chen, Xianyong Lan. "Associations of six SNPs of POU1F1-PROP1-PITX1-SIX3 pathway genes with growth traits in two Chinese indigenous goat breeds", Annals of Animal Science, 2017)
Lin Ma, Qiaomei Qin, Qing Yang, Meng Zhang, Haiyu Zhao, Chuanying Pan, Chuzhao Lei, Hong Chen, Xianyong Lan. "Associations of six SNPs of POU1F1-PROP1-PITX1-SIX3 pathway genes with growth traits in two Chinese indigenous goat breeds", Annals of Animal Science, 2017

< 1% match (Mahmoud S. El-Tarabany, Asmaa W. Zaglool, Akram A. El-Tarabany, Ashraf Awad. "Association analysis of polymorphism in KiSS1 gene with reproductive traits in goats", Animal Reproduction Science, 2017)
Mahmoud S. El-Tarabany, Asmaa W. Zaglool, Akram A. El-Tarabany, Ashraf Awad. "Association analysis of polymorphism in KiSS1 gene with reproductive traits in goats", Animal Reproduction Science, 2017

< 1% match (Morteza Mahdavi, Shahram Nanekarani, Seyed Davood Hosseini. "Mutation in BMPR-IB gene is associated with litter size in Iranian Kalehkoohi sheep", Animal Reproduction Science, 2014)
Morteza Mahdavi, Shahram Nanekarani, Seyed Davood Hosseini. "Mutation in BMPR-IB gene is associated with litter size in Iranian Kalehkoohi sheep", Animal Reproduction Science, 2014

< 1% match (Reshmi Sasi, Raji Kanakkaparambil, Aravindakshan Thazhathuveettil. "Polymorphism of fecundity genes, BMPR1B, BMP15 and GDF9, in tropical goat breeds of Kerala", Gene Reports, 2020)
Reshmi Sasi, Raji Kanakkaparambil, Aravindakshan Thazhathuveettil. "Polymorphism of fecundity genes, BMPR1B, BMP15 and GDF9, in tropical goat breeds of Kerala", Gene Reports, 2020

< 1% match (Sadreddin Anvari Majd, Ahmad Ahmadi, Reza Talebi, Pezhman Mahmoodi Koohi, Stéphane Fabre, Saber Qanbari. "Polymorphism identification in ovine KISS1R/GPR54 gene among pure and crossbreeds of Iranian sheep", Small Ruminant Research, 2019)
Sadreddin Anvari Majd, Ahmad Ahmadi, Reza Talebi, Pezhman Mahmoodi Koohi, Stéphane Fabre, Saber Qanbari. "Polymorphism identification in ovine KISS1R/GPR54 gene among pure and crossbreeds of Iranian sheep", Small Ruminant Research, 2019

< 1% match (Internet from 01-Oct-2021)
https://coek.info/pdf-current-status-of-molecular-genetics-research-of-goat-fecundity-.html

< 1% match (Internet from 21-Apr-2021)
https://ijvsbt.org/index.php/journal/article/download/327/198

< 1% match (Internet from 07-Jun-2021)
http://repository.ipb.ac.id:8080/bitstream/handle/123456789/76886/234%2c%20Identification%20of%20GDF9%20Gene%20and%20its%20Relationship%20With%20The%

20Prolific%20Traits%20on%20Indonesian%20Local%20Goats.pdf?isAllowed=y&sequence=1

< 1% match (AS El-Seedy, NM Hashem, KM El-Azrak, ANM Nour El-Din, TA Ramadan, TA Taha, MH Salem. " Genetic screening of mutations and their linkage with litter size in Barki and Rahmani sheep breeds ", Reproduction in Domestic Animals, 2017)

AS El-Seedy, NM Hashem, KM El-Azrak, ANM Nour El-Din, TA Ramadan, TA Taha, MH Salem. " Genetic screening of mutations and their linkage with litter size in Barki and Rahmani sheep breeds ", Reproduction in Domestic Animals, 2017

< 1% match (Arsalan Barazandeh, Morteza Mokhtari, Zahra Roudbari, Rouhollah Mirmahmoudi. "A Meta-analysis Study of Association Between FecB Polymorphism and Litter Size in Sheep", Research Square Platform LLC, 2021)

Arsalan Barazandeh, Morteza Mokhtari, Zahra Roudbari, Rouhollah Mirmahmoudi. "A Meta-analysis Study of Association Between FecB Polymorphism and Litter Size in Sheep", Research Square Platform LLC, 2021

< 1% match (Jinxing HOU. "Exploring polymorphisms and their effects on reproductive traits of the INHA and INHβA genes in three goat breeds : INHA GENE AND LITTER SIZE IN GOAT", Animal Science Journal, 04/2012)

Jinxing HOU. "Exploring polymorphisms and their effects on reproductive traits of the INHA and INHβA genes in three goat breeds : INHA GENE AND LITTER SIZE IN GOAT", Animal Science Journal, 04/2012

< 1% match (Lopes, T.A., J.J.N. Costa, R.P. Ribeiro, J.R.S. Passos, M.A.A. Soares, J.G. Alves Filho, E.V. Cunha, R. van den Hurk, A.A. Pinheiro, and J.R.V. Silva. "Influence of caprine arthritis encephalitis on expression of ovulation related genes and activation of primordial follicles cultured in presence of phytohemagglutinin, epidermal growth factor or both", Small Ruminant Research, 2015.)

Lopes, T.A., J.J.N. Costa, R.P. Ribeiro, J.R.S. Passos, M.A.A. Soares, J.G. Alves Filho, E.V. Cunha, R. van den Hurk, A.A. Pinheiro, and J.R.V. Silva. "Influence of caprine arthritis encephalitis on expression of ovulation related genes and activation of primordial follicles cultured in presence of phytohemagglutinin, epidermal growth factor or both", Small Ruminant Research, 2015.

< 1% match (Pouya Zamani, Ramin Abdoli, Ali Deljou, Hosein Rezvan. "Polymorphism and Bioinformatics Analysis of Growth Differentiation Factor 9 Gene in Lori Sheep", Annals of Animal Science, 2015)

Pouya Zamani, Ramin Abdoli, Ali Deljou, Hosein Rezvan. "Polymorphism and Bioinformatics Analysis of Growth Differentiation Factor 9 Gene in Lori Sheep", Annals of Animal Science, 2015

< 1% match (Sanbao Zhang, Xiaotong Gao, Yuhang Jiang, Yujian Shen, Hongyue Xie, Peng Pan, Yanna Huang, Yingming Wei, Qinyang Jiang. "Population validation of reproductive gene mutation loci and association with the litter size in Nubian goat", Archives Animal Breeding, 2021)

Sanbao Zhang, Xiaotong Gao, Yuhang Jiang, Yujian Shen, Hongyue Xie, Peng Pan, Yanna Huang, Yingming Wei, Qinyang Jiang. "Population validation of reproductive gene mutation loci and association with the litter size in Nubian goat", Archives Animal Breeding, 2021

< 1% match (Wioleta Drobik-Czwarno, Elżbieta Martyniuk, Zuzanna Nowak-Życzyńska, Urszula Kaczor, Mirosław Kucharski. "Frequency of BMP15 and GDF9 mutations increasing litter size and their phenotypic effects in Olkuska sheep population", Annals of Animal Science, 2020)

Wioleta Drobik-Czwarno, Elżbieta Martyniuk, Zuzanna Nowak-Życzyńska, Urszula Kaczor, Mirosław Kucharski. "Frequency of BMP15 and GDF9

mutations increasing litter size and their phenotypic effects in Olkuska sheep population", Annals of Animal Science, 2020

< 1% match (Xianyong Lan. "A novel missense (A79V) mutation of goat PROP1 gene and its association with production traits", Molecular Biology Reports, 11/22/2008)

Xianyong Lan. "A novel missense (A79V) mutation of goat PROP1 gene and its association with production traits", Molecular Biology Reports, 11/22/2008

< 1% match (Zhi-gang Niu, Jin Qin, Yao Jiang, Xiang-Dong Ding, Yu-gong Ding, Sen Tang, Hong-cai Shi. "The Identification of Mutation in BMP15 Gene Associated with Litter Size in Xinjiang Cele Black Sheep", Animals, 2021)

Zhi-gang Niu, Jin Qin, Yao Jiang, Xiang-Dong Ding, Yu-gong Ding, Sen Tang, Hong-cai Shi. "The Identification of Mutation in BMP15 Gene Associated with Litter Size in Xinjiang Cele Black Sheep", Animals, 2021

< 1% match ()

Amirpour Najafabadi, Hamed. "Investigation of variation in genes influencing fertility in New Zealand sheep : A thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy at Lincoln University", 'Lincoln University College', 2019

< 1% match ()

Gunawan, Muhammad Indra. "Hubungan antara umur dengan bobot badan induk dan litter size kambing Senduro di kecamatan Senduro kabupaten Lumajang", 2019

< 1% match (Internet from 23-Nov-2018)

http://www.au-ibar.org/component/jdownloads/finish/14/2796

< 1% match (Danni Li, Lei Zhang, Yuchen Wang, Xingzhuo Chen, Fu Li, Lichun Yang, Jiuzeng Cui, Ran Li, Binyun Cao, Xiaopeng An, Yuxuan Song. " mutation and litter size are associated with a 90-base pair deletion in in East Friesian and Hu crossbred sheep ", Animal Biotechnology, 2022)

Danni Li, Lei Zhang, Yuchen Wang, Xingzhuo Chen, Fu Li, Lichun Yang, Jiuzeng Cui, Ran Li, Binyun Cao, Xiaopeng An, Yuxuan Song. " mutation and litter size are associated with a 90-base pair deletion in in East Friesian and Hu crossbred sheep ", Animal Biotechnology, 2022

< 1% match (R. Jabbari Ori, A. K. Esmailizadeh, H. Charati, M. R. Mohammadabadi, S. S. Sohrabi. "Identification of QTL for live weight and growth rate using DNA markers on chromosome 3 in an F2 population of Japanese quail", Molecular Biology Reports, 2014)

R. Jabbari Ori, A. K. Esmailizadeh, H. Charati, M. R. Mohammadabadi, S. S. Sohrabi. "Identification of QTL for live weight and growth rate using DNA markers on chromosome 3 in an F2 population of Japanese quail", Molecular Biology Reports, 2014

< 1% match (Xinyu Wang, Qing Yang, Ke Wang, Hailong Yan, Chuanying Pan, Hong Chen, Jinwang Liu, Haijing Zhu, Lei Qu, Xianyong Lan. "Two strongly linked single nucleotide polymorphisms (Q320P and V397I) in GDF9 gene are associated with litter size in cashmere goats", Theriogenology, 2019)

Xinyu Wang, Qing Yang, Ke Wang, Hailong Yan, Chuanying Pan, Hong Chen, Jinwang Liu, Haijing Zhu, Lei Qu, Xianyong Lan. "Two strongly linked single nucleotide polymorphisms (Q320P and V397I) in GDF9 gene are associated with litter size in cashmere goats", Theriogenology, 2019

< 1% match (G. Li, H.-P. Wu, M. Z. Fu, Z.-Q. Zhou. "Novel single nucleotide polymorphisms of GnRHR gene and their association with litter size in goats", Archives Animal Breeding, 2011)

G. Li, H.-P. Wu, M. Z. Fu, Z.-Q. Zhou. "Novel single nucleotide polymorphisms of GnRHR gene and their association with litter size in goats", Archives Animal Breeding, 2011

< 1% match ()
Lindawati Doloksaribu. "Improvement of rearing goats in Bali Province, Indonesia", 'University of Queensland Library', 2017

< 1% match ()
Wouobeng, Patrick, Kouam Simo, Jaures et al. "Polymorphism of Prolificacy Genes (BMP15, BMPR 1B and GDF9), in the Native Goat (Capra hircus) of Cameroon", 'University of Tlemcen', 2019

Identification of FecXG and FecX mutations and End Match its association with Litter Size in End Match Kacang and End Match Boerka Goat Maskur1*, Muhammad Muhsinin1 and Sulaiman Ngongu Depamede2 1Laboratory of animal genetics and breeding, Faculty of Animal Science, University of Mataram, Indonesia End Match; 2Laboratory of End Match Biotechnology Faculty of Animal Science, University of Mataram Abstract The End Match Kacang goat is one of Indonesia's prolific native goat breeds, while the Boerka goat is a crossbreed between Kacang and End Match Boer goats End Match. It is widely known that the ovulation rate and litter size in sheep breeds End Match are significantly impacted by the BMP15 (FecXG) and BMPR-1B (FecB) gene alterations. Based on this knowledge, the study's objective was to determine the presence of BMP15 and BMPR-1B gene polymorphisms and how they affected the prolific traits of Kacang and Boerka goats. This study indicates that the FecXG and FecB mutations were associated with litter size in End Match Kacang and End Match Boerka goat breeds. The End Match FecXG has two genotypes in both Kacang and Boerka goats, namely homozygote wild type ++ and heterozygote mutant carrier G+ with a litter size of 1.56 and 1.65 (Kacang); 1.61 and 1.75 (Boerka), respectively. Meanwhile, FecB mutations produce three genotypes: homozygote wild type ++, heterozygote mutant carrier B+ and homozygote mutant BB with a litter size of 1.00, 1.37, and 1.65 (Kacang); and 1.00, 1.18, and 1.74 (Boerka), respectively. Keywords: goat, FecXG, FecB, polymorphic and litter size. *Correspondence | Maskur, Faculty of Animal Science, University of Mataram, 62 Majapahit Street, Lombok, 81325 West Nusa Tenggara Province, Indonesia; Email: maskur@unram.ac.id End Match INTRODUCTION In Indonesia, the End Match increase in the goat population is generally related to empowering the economy of rural households, supporting food security, and improving the nutritional quality of families. Goats have great potential to increase rural and urban prosperity due to their ability to adapt well to tropical climates, have better productivity, and can utilize low-quality fiber (Kumar et al., 2016; Ahlawat et al., 2015) so that it can be effortlessly maintained in a dry land farm. The Kacang goat is one of the native Indonesian goats that have high fertility, with a litter size End Match of 1.56–1.98 kids per birth End Match, 52.2% for twins, and 2.6% for triplets (Pamungkas et al., 2009). While the Boerka goat is a hybrid goat resulting from a cross between Kacang and Boer goat. As a hybrid breed, Boerka goats have the potential to be developed as meat-producing goats because of their better growth and meat quality. Boerka goats have a birth weight of 2.6-2.8 kg with a weaning weight of 10-12 kg, while the birth weight of Kacang goats was 1.6-1.8 kg with a weaning weight of 6-8 kg. Boerka goats also have prolific characteristics, with a litter size of 1.45–1.54 kids per birth (Mahmilia and Elieser, 2008). Prolific traits are reproductive traits that have high economic value in goats, where high litter size can accelerate goat population growth. The tendency

to produce twins or triplets in goats and sheep is the same, and this trait is passed on to their offspring. The genetic mechanism of increasing litter size due to the FecB and FecX mutations has been widely reported. However, prolificacy regulation at the gene level is different in sheep and goats. Mutations in the BMP15 gene make granulosa cells more sensitive to FSH, accelerating the formation of follicular and early ovulation of tiny follicles, thereby increasing ovulation in ewes (Moore and Shimasaki, 2005). Granulosa cells and oocytes express the BMP receptor (BMPR) and End Match then bind to BMP15. The ovulation rate is enhanced by one copy due to an additive effect of the BMPR-1B gene mutation (Pramod et al., 2013; Guo et al., 2018). As in sheep, the genetics of prolificacy has also been studied extensively in goats. Several studies have shown that the BMP15 gene is End Match also the primary gene that End Match regulates prolificacy End Match in goats, such as in Funiu white (Wang et al., 2011 End Match), Jining Gray (Chu et al End Match., 2007), Beetal and Teddy (Islam et al End Match., 2019), and End Match Markhoz goats End Match (Ghoreishi et al End Match., 2019). Polymorphism in the BMPR-1B gene was also reported to be associated with prolific traits in Black Bengal (Polley et al., 2009 End Match), Beetal, and End Match Teddy goats End Match (Islam et al End Match., 2019). On the contrary, Hua et al. (2008) showed none of the FecB and FecX End Match polymorphism in prolific End Match goat breeds End Match, including Haimen, Huanghuai, Boer, Nubi and Matou. Based on the abovementioned, the mechanism and regulation pathways of fecundity genes in prolific goats are not clear, so additional study is still required in various breeds and a large sample size of a goat. In goats, litter size is a End Match reproductive trait with low heritability End Match and is regulated by more than one gene. Therefore, it is crucial to provide scientific information for designing a set of DNA markers that End Match can be useful End Match for marker-assisted selection (MAS End Match) in Kacang and Boerka goats. MATERIAL AND End Match METHOD Experimental animals and DNA isolation End Match The experiments were End Match carried out with a total sample was 211 female goats, consisting of 111 Boerka and 100 Kacang goats. All samples were collected at PT. Sadhana Arif Nusa, East Lombok, West Nusa Tenggara, Indonesia. For association analysis, the number of kids for every birth and the average litter size for each ewe of the first three parities End Match were recorded End Match. Blood samples were collected from each animal using a K2EDTA Venoject tube and preserved at -25°C. The Genomic DNA End Match extraction was performed according to the Genomic DNA Mini Kit Geneid procedure. PCR amplification and Genotyping Primer 3.0 software was used to design End Match two pairs of PCR primers based on the End Match Ovis aries genbank database (GenBank access code: NC_022322) and the published nucleotide sequence of the caprine gene End Match. The forward and reverse primers for exon 2 of BMP15 and exon End Match 6 of End Match BMPR1B genes End Match are presented in table 1. DNA amplification was carried out in the Nexus Mastercycler PCR machine with a reaction volume of a 15 µl consisted 1 µl DNA, 0.5 µl Primers End Match, 6.25 µl End Match MyTaq HS Red Mix, 2x and 7.25 µl Water (dH2O). Amplification conditions were as follows End Match: pre-denaturation End Match conditions for 5 End Match minutes at 95 End Match oC, followed by End Match 35 cycles of denaturation End Match step at 95 oC for End Match 10 s, annealing at 60 oC for End Match 20 s, and elongation at 72 oC for 30 s End Match; with the final elongation End Match stage at 72 oC for End Match 5 minutes in one cycle. About 5 µl of each PCR product End Match were digested End Match separately with End Match Hinf1 10 U End Match for BMP15 and AvaII 10 U for BMPR-1B at 37 °C overnight. The digested product was separated End Match by 2.5% agarose gel End Match electrophoresis and visualized in an AlphaImager (Alpha Innotech Corporation, USA). Data analysis Popgene version 1.31 software was used

to End Match investigate the genotype End Match and allele frequencies, heterozygosity, polymorphism information content End Match, and Hardy-Weinberg equilibrium. SNP position determination was corrected to Ensembl's DNA sequence using the MEGA-X program (ENSCHIG00000024611). The association of genotypes with End Match the litter size of End Match Kacang and Boerka goats End Match was examined using the General Linear Model procedure End Match with SAS 9.1.3 software (SAS Institute, Cary, NC, USA). The End Match linear model applied was End Match: Yiklm = μ + Ci + Bk + (BC)ik+ Sl + Eiklm Where, Yiklm End Match is the trait End Match observation of the iklmth End Match animals; μ is the overall mean End Match; Ci is the End Match genotype effect of the End Match ith; Bk is the End Match breed effect End Match of the End Match kth; (BC)GNRH1 and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.">ik is the interaction between the ith and the kth End Match; S1 GNRH1 and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.">is the End Match sire GNRH1 and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.">effect End Match of GNRH1 and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.">the lth, and End Match Eiklm GNRH1 and *GDF9* genes and their association analysis with litter size", Animal Genetics, 2013.">is the random error End Match.

RESULT AND DISCUSSION Polymorphism of BMP15 gene in Kacang and Boerka Goat Amplifying the BMP15 gene in Kacang and Boerka goats produced DNA fragments (PCR products) with a length of 141 bp (Figure 1). The BMP15 gene mutation was identified by the RFLP method using the Hinf1 restriction enzyme with the G|ANTC cleavage site (Figure 2). The wild type of the exon 2 BMP15 gene sequence has a cleavage site for the Hinf1 enzyme that produces alleles with sizes of 111 bp and 30 bp (+ allele), respectively. The C/T transition mutation caused a change in the cleavage site of the HinfI enzyme at position 718 (c.718C>T) of the BMP-15 gene End Match, which resulted in End Match a mutant allele (G allele) with a size of 141 bp. Identification of allele and genotype of the BMP15 gene using the method of RFLP- Hinf1 resulted in wild type + and mutant type G allele with homozygote wild type ++ and heterozygote mutant carrier G+ genotypes, while the homozygote mutant GG genotype was not identified on Kacang and Boerka goats (Figure 2). The allelic and genotypic frequency distributions indicate a very contrasting difference ($P<0.01$). In the End Match two goat End Match breeds, the End Match genotype ++ was significantly End Match higher than the G+, and the + allele was significantly higher than the End Match G allele End Match (Table 2). The presence of polymorphic sites for exon 2 of End Match the BMP15 gene End Match has been published in End Match various breeds of End Match goats, such as Jining Grey (Chu et al., 2007 End Match); Guizhou White (Ran et al., 2009 End Match); Taihang black and Funiu white (Wang et al., 2011 End Match); Beetal and End Match Teddy goats (Islam et al End Match., 2019). In this End Match study, the End Match homozygous mutant GG was not found in the Kacang and Boerka goat populations. Similarly, homozygous mutant GG also was not found in several goat breeds, such as Teddy goats (Islam et al., 2019), Markhoz goats (Ghoreishi et al., 2019), Taihang black (Wang et al., 2011), and End Match Jining gray (Chu et al End Match., 2007); and some breeds of sheep, including the Small Tailed Han (Chu et al., 2007 End Match), Belclare (Mullen et al End Match., 2013), Barki and End Match Rahmani (El-Seedy et al End Match., 2017), six Egyptian sheep breeds (Saleh et al. 2020), and Lombok Fat Tail (Maskur et al., 2016). The Possible reasons need to be explained that no GG ewes were observed in the present study. A tendency towards accumulating and losing certain genotypes could be due to intensive selection. GG ewes may exist in the Kacang and Boerka breeds, but this research used experimental ewes with a litter record, so

all infertile ewes were excluded. Another possible reason that GG ewes may not exist in the Kacang and Boerka breeds is that there are no reports of infertility among Kacang and Boerka goats, as in Belclare sheep. Polymorphism of BMPR-1B gene in Kacang and Boerka Goat Amplifying the BMPR-1B gene in Kacang and Boerka goats produced DNA sequences with a length of 140 bp. The wild type sequence of exon 6 of the BMPR-1B gene End Match has no cleavage site for the AvaII restriction enzyme, so the wild type allele is 140 bp End Match (+). Mutations at this locus are transition mutations that End Match convert adenine End Match into guanine at the End Match base position End Match 746 coding regions of the BMPR-1B gene (c.746A>G). These mutations cause the formation of a cleavage site for the AvaII restriction enzyme (G|GACC), so the digestion produces mutant alleles measuring 110 and 30 bp (B) in length. Identification of allele and genotype using the method of RFLP-AvaII resulted in two alleles, namely mutant B (110 bp and 30 bp) and wild + allele (140 bp), with three genotypes ++ (homozygote wild type), B+ (heterozygote mutant carrier), and BB (homozygote mutant) (Figure 4). The allelic and genotypic frequency distributions indicate a highly contrasting difference (P<0.01). The End Match frequency of the End Match wild + allele was significantly higher than End Match the mutant B allele, and the genotypic ++ was significantly higher than B+ and BB in the two goats breed (Table 3). However, the previous research in several sheep breeds indicates the abundance of mutant alleles compared to wild alleles, such as in prolific Garole (Polley et al., 2010); Indonesian fat-tailed (Maskur et al End Match., 2016); Small End Match-Tail Han (Chu et al End Match., 2007; Wen et al End Match., 2021); and Bayanbulak End Match sheep (Zuo et al., 2013 End Match). Similar to this study, the FecB mutation has been End Match previously found in several End Match goat breeds End Match, including Black Bengal (Polley et al., 2009 End Match), Markhoz (Shokrollahi and Morammazi, 2018 End Match), Beetal and Teddy goats (Islam et al., 2019). In contrast, it has not been found in some other goat breeds, including the Rayini goats of Iran (Gazooei et al., 2013 End Match), the prolific Raighar (Palai et al., 2013), the Indian Berari and Surti goat (Sharma et al. 2016; Dangar et al., 2019), and some Egypt sheep breeds End Match (Abulyazid et al End Match., 2011; El End Match-Seedy et al End Match., 2017; Saleh et al End Match., 2020). The possible reasons for the differences between the results obtained from different breeds may be due to: (1) the accumulation of certain genotypes and alleles as a result of intensive selection, (2) the possibility of inbreeding, and (3) the possibility of previous genes introgression as a breeding strategy. Genetic Diversity Within the End Match Goat Breeds End Match The genetic diversity End Match of a population is End Match represented by the number of alleles End Match, expected heterozygosity (He End Match), observed heterozygosity (Ho), and End Match Polymorphic Information Content (PIC) values End Match as the fundamental data for individual and population discrimination (Seo et al., 2016 End Match). Data in table 4 indicate a genotypic imbalance in the two goat populations where the observed heterozygosity was significantly different from the Hardy-Weinberg expectation agreement. In this study, the low level of Ho and He values revealed low genetic diversity in the two goat populations. The occurrence of heterozygosity deficits in the population is caused by selection pressure at certain loci and inbreeding. The PIC value of the FecXG (c.718C>T) in both Kacang and Boerka goat breeds was 0.211 and 0.221, while FecB (c.746A>G) was 0.170 and 131, respectively. Base on Bolstein et al. (1980), the PIC End Match level classified as highly (PIC > 0.50), reasonably End Match (0.50 > PIC > 0 End Match.25), and slightly (PIC < 0.25) informative. Thus End Match, in recent research, the PIC value in both BMP15 and BMPR1B was classified as slightly informative (PIC < 0.25 End Match). Association of The End Match

FecXG and FecB mutations with Litter Size in the Goat Breeds The End Match mutations of FecXG (c.718C>T) and FecB (c.746A>G) were investigated as potential gene candidates for prolificacy in Indonesian Kacang and Boerka goats. The mutations and their End Match influence on litter size and ovulation rates End Match were initially found in sheeps and subsequently identified in other species, such as goats. On the other hand, no FecB and FecXG mutations and End Match/or their association with litter size End Match were detected in End Match earlier studies in various breeds of sheep End Match and goats. The influence of The End Match FecXG (c.718C>T) mutation on goat litter size is apparent from the data of this study (Table 5). We found two genotypes in both goat breeds, namely homozygote wild type ++ and heterozygote carrier G+, in which the G+ had a higher number of kids than the ++ genotype. These findings are similar to the previous study done on Jining Grey goats, in which the heterozygote carrier AB had 1.13 more offspring than the homozygote AA ($p < 0.01$) (Chu et al., 2007). Conversely, some other researchers observed that the homozygote mutant goats had the most offspring, followed by the heterozygote carrier and homozygote wild-types, such as Beetal and Teddy goats (Islam et al., 2019), Anglo-Nubian (Abdel-Rahman et al., 2013), Funiu white and Taihang black (Wang et al., 2011). In some sheep breeds, such as the Small Tailed Han (Chu et al., 2007 End Match; Zhang et al End Match., 2011), the End Match Chios (Liandris et al End Match., 2012), the Rahmani, and the Rahmani x Barki Cross (Saleh et al., 2020), previous studies also demonstrated that the heterozygote carrier genotype for BMP-15 had a larger litter size than the End Match homozygote wild-type End Match. In contrast, several other studies found that the homozygote wild type had a higher litter size than the heterozygote carrier. Meanwhile, homozygote carrier sheeps for this mutation were infertile. Mc Natty et al. (2005) state that FecXG mutation causes premature stop codon at amino acid residue 239 (CAG -->TAG, Q239Ter), resulting in immature protein, which may result in loss of BMP15 function. The relationship between BMP15 mutations and ovulation rates is based on the concept that the rate of ovulation will increase if the expression of the BMP15 gene is lower, but if the level of BMP15 is too low, it will cause total dysfunction (Fabre et al., 2006). The important role of BMP15 in modulating litter size and End Match the rate of End Match ovulation in End Match sheeps and goats was supported by several previous studies. The BMP15 gene expression was significantly ($P<0.05$) higher in End Match the prolific goat End Match than in non-prolific goats' ovaries (Yang et al., 2012 End Match; Pramod et al., 2013 End Match; Pan et al., 2015 End Match). However, Crawford et al End Match. (2011) found that End Match the BMP15 End Match gene expression in the End Match oocytes of prolific was lower End Match than in End Match wild Booroola Romney sheeps. This finding suggests that BMP15 plays a distinct role in goats and sheep, and that it may regulate female fertility and ovulation rate in a species-specific manner (Al- Musawi et al., 2013 End Match). In the current research, we observed a negative relationship between FecB mutation (A746G or Q249R) and Litter Size (LS) in prolific Kacang and Boerka goats (Table 5). The Litter Size of End Match the wild-type End Match ++ goats was End Match greater than End Match carrier B+ and mutant BB goats. Polley et al. (2009) found a positive effect of FecB mutation on Black Bengal goats in which the genotypes of homozygote wild type, heterozygote carrier and homozygote mutant had litter sizes of 2.7, 3.04, and 3.11, respectively. However, some previous studies showed the FecB mutation had low polymorphism and no association with litter size in Anhui White, Wendeng Dairy, Jining Grey, Boer, Liaoning Cashmere, Barbari, Malabari, Osmanabadi, and Ganjam goats (Ahlawat et al., 2014; Chu et al., 2010). The different genetic impacts of these mutations are possibly caused by the intense selection pressure on the population resulting in the accumulation of certain genotypes. This in turn would have an impact on

the effective population size End Match in the End Match goat genotype group and would End Match alter the End Match results of the End Match significant association End Match analysis. Another possible reason is that the BMPR-1B gene expression may vary between breeds and environmental conditions or due to the interactions between breeds and the environment (Fogerty, 2008). In sheep breeds, some researchers have confirmed that the FecB mutation has an effect on ovulation End Match rate and End Match/or litter End Match sizes, such as Dorset, Mongolian, Small-Tail Han End Match, Hu and Bayanbulak sheep (China End Match: Jia et al End Match., 2019; Wen et al End Match., 2021; Wang et al End Match., 2018; Zuo et al., 2013); Garole, Nilagiri, Nellore and Deccani sheep (India: Polley et al., 2010 End Match; Praveena et al End Match., 2017; Chaudhari et al., 2019 End Match); Mehraban and Kalehkoohi (Iran End Match: Abdoli et al End Match., 2013 End Match ; Talebi et al End Match., 2018; Mahdavi et al., 2014). The End Match important role of End Match FecB mutations in the regulation of sheep reproduction has been confirmed in several previous studies. The FecB mutation reduces the BMPR-IB inhibitory effect on granulosa cell steroidogenesis so that they are more sensitive to FSH; thus, the End Match cell division becomes more End Match active, leading to End Match the maturation and ovulation of multiple ovarian follicles (Fabre et al., 2006). The basic concept of the prolific nature is that an increased ovulation rate leads to a more significant number of ovulated oocytes and if fertilization occurs and End Match the parent is able to maintain a viable embryo, it will be followed by the birth of more than one End Match kid (Wilson et al., 2001 End Match). 7 CONCLUSION End Match According to these results, we can state that BMP15 and BMPR1B genes were polymorphic and significantly affected the litter size in End Match Kacang and End Match Boerka goats End Match. The results of this study End Match will hopefully provide a basis for the development of End Match marker-assisted selection (MAS) for End Match goat breeding End Match programs in End Match the future. However, our study has limitations on the effective population size of each genotype group in the test goats, which will impact the association analysis results. Therefore, further investigations on large and balanced populations are required to confirm the End Match association of End Match BMP15 and BMPR1B genes with increased prolificacy in End Match Kacang and Boerka goats. Acknowledgment The University of Mataram Research Grant funded this research with contract number: 2832/UN18.L1/PP2020. The greatest appreciation to the Rector of the University of Mataram for the support End Match of this research End Match. Novelty Statement The End Match authors declare that the article is original and sourced from unpublished research data. The Faculty of Animal Science University of Mataram's ethics committee granted all the research materials and procedures with registration number: 10/UN18.F2/EC/2021. Author’s Contributions Maskur was responsible for designing, analyzing, interpreting data, and preparing the manuscript; Muhammad Muhsinin was responsible for phenotypic and genotypic analysis, and preparation of the manuscript; and Sulaiman Ngongu Depamede was responsible for the experiment, laboratory analysis, and article preparation. REFERENCES Abdel-Rahman SM, Mustafa YA, Abd Errasool HA, El-Hanafy AA, El-Maghraby AM (2013). Polymorphism in BMP-15 gene and its association with litter size in Anglo-Nubian goat. Biotechnology in Animal Husbandry. 29(4): 675?683. https://doi.org/10.2298/BAH1304675A Abdoli R, Zamani P, Deljou A, and Rezvan, H (2013). Associations of BMPR-1B and GDF9 genes polymorphisms and secondary protein structure changes with reproduction traits in Mehraban ewes. J.Gene, 524: 296–303. https://doi.org/10.1016/2013.03.133 Abulyazid I, Abdalla M, Sharada H, Saleh H, Hassanin W (2011). Prolificacy detection in Egyptian sheep using RFLP-specific PCR. Egypt Acad J. Biological Sci., 1: 1–4. Ahlawat S,

Sharma R, Maitra A, Tantia MS (2015). Current status of molecular genetics research of goat fecundity. [Review]. Small Ruminant Research, 125: 34?42. Ahlawat S, Sharma R, Maitra A, Tantia MS, Roy M, Mandakmalen S (2014). New genetic polymorphisms in Indian goat BMPR1B gene. Indian J. Anim. Sci. 84: 37–42. Al-Musawi SL, Walton KL, Heath D, Simpson CM, Harrison CA (2013). Species differences in the expression and activity of bone morphogenetic protein-15. Endocrinology, 154: 888–899. [CrossRef] [PubMed] Chaudhari A, Ramanujam R, Ragothaman V (2019). Effect of Booroola fecundity (FeCB) gene on litter size and scope for use in restoration of Nilagiri sheep from threatened status. Rev. Agrária Acadêmica., 2: 11-6. Chu MX, Jiao CL, He YQ, Wang JY, Liu ZH, Chen GH (2007). Association between PCR-SSCP of bone morphogenetic protein 15 gene and prolificacy in Jining Grey goats. Anim Biotechnol.18(4):263-74. https://doi:10.1080/10495390701331114 Chu MX, Liu ZH, Jiao CL, He YQ, Fang L, Ye S, Chen GH, Wang JY (2007). Mutations in BMPR- IB and BMP-15 genes are associated with litter size in small tailed han sheep (Ovis aries). J Anim Sci.;85(3): 598–603. Chu MX, Zhao XH, Zhang YJ, Jin M, Wang JY, Di R, Cao GL, Feng T, Fang L, Ma YH, Li K (2010). Polymorphisms of BMPR-IB gene and their relationship with litter size in goats. Mol. Biol. Rep., 37: 4033-4039. Crawford JL, Heath DA, Reader KL, Quirke LD, Hudson NL, Juengel JL, McNatty KP (2011). Oocytes in sheep homozygous for a mutation in bone morphogenetic protein receptor 1B express lower mRNA levels of bone morphogenetic protein 15 but not growth differentiation factor 9. Reproduction, 142: 53–61. Dangar NS, Pandya GM, Ramani UV, Padheriya YD, Sangma T, Patel SS, Devkatte S (2019). Association Study of Fecundity Gene BMPR1B with Prolificacy in Surti Goats under Farm and Field Condition. Ind. J. of Vet. Sci. and Biotech., 14(4): 17-20. El-Seedy AS, Hashem NM, El-Azrak KM, Nour EA, Ramadan TA, Taha TA, Salem MH (2017). Genetic screening of FecB, FecX(G) and FecX(I) mutations and their linkage with litter size in Barki and Rahmani sheep breeds. Reprod. Domest. Anim., 52: 1133–1137. https://doi.org/10.1111/rda.13002 Fabre S, Pierre A, Mulsant P, Bodin L, DiPasquale E, Persani L, Monget P, Monniaux D (2006). Regulation of ovulation rate in mammals: contribution of sheep genetic models. Reprod. Biol. Endocrinol. 4: 20. Fogerty (2008). Environmental modulation of FecB expression. Use of the FecB (Booroola) gene in sheep-breeding programs. Proc. of the Helen Newton Turner Memorial International Workshop held in Pune. Maharashtra. India, 1: 66-75. Gazooei YM, Niazi A, and Zamiri MJ (2013). Single nucleotide polymorphism analysis of the bone morphogenetic protein receptor IB and growth and differentiation factor 9 genes in Rayini goats (Capra hircus). J. Livestock Sci. Technologies, 1: 45-50. Ghoreishi H, Sadegh Fathi-Yosefabad, Jalal Shayegh, and Abolfazl Barzegari (2019). Identification of mutations in BMP15 and GDF9 genes associated with prolificacy of Markhoz goats. Arch. Anim. Breed., 62, 565–570, 2019 Guo X, Wang X, Di R, Liu Q, Hu W, He X, Yu J, Zhang X, Zhang J, Broniowska K (2018). Metabolic effects of FecB gene on follicular fluid and ovarian vein serum in sheep (Ovis aries). Int J Mol Sci., 19(2): 539. Hua GH, Chen SL, Ai JT, Yang LG (2008). None of the polymorphism of ovine fecundity major genes FecB and FecX was tested in goat. Anim. Reprod. Sci., 108: 279–286. Islam M, Basheer A, Javed K, Anjum AA, Zahoor I (2019). PCR-RFLP-based identification of polymorphisms in BMPR1B, GDF9 and BMP15 genes associated with litter size in Beetal and Teddy goats. S. Afr. J. Anim. Sci., 49 (4): 697-708. Jia J, Qian C, Gui L, Jin J, Li Y, Ru Q, Hou S (2019). Association of polymorphisms in bone morphogenetic protein receptor-1B gene exon-9 with litter size in Dorset, Mongolian, and Small Tail Han ewes. Asian-Aust. J. Anim. Sci., 32: 949-955 Kumar R, Taraphder S, Sahoo A, Senpati P, Paul R, Roy M, Sarkar U, Raja D, Samanta I, Baidya S (2016). Polymorphism and nucleotide sequencing of BMP-15 gene in an organised herd of Garole sheep (Ovis aries). Indian J. Anim. Sci., 55(1): 77-86. Liandris E, Kominakis A, Andreadou M, Kapeoldassi K, Chadio S, Tsiligianni T, Gazouli M,

Ikonomopoulos I (2012). Associations between single nucleotide polymorphisms of GDF9 and BMP15 genes and litter size in two dairy sheep breeds of Greece. Small Rumin. Res., 107: 16- 21. Mahdavi M, Nanekarani S, Hosseini SD (2014). Mutation in BMPR-IB gene is associated with litter size in Iranian Kalehkoohi sheep. Anim. Reprod. Sci., 147: 93-98. Mahmilia F and Elieser S (2008). Korelasi lama bunting dengan bobot lahir, litter size dan daya hidup kambing Boerka-1. Pros. Sem. Nas. Tekn. Pet. & Vet. Puslitbangnak Deptan, Bogor, Hal. 391- 394. Maskur M, Tapaul R, Kasip L (2016). Genetic polymorphism of bone morphogenetic protein receptor 1B (BMPR-1B) gene and its association with litter size in Indonesian fat-Tailed sheep. African J. Biotech., 15(25): 1315-1319. Mc Natty KP, Juengel JL, Reader KL, Lun S, Myllymaa S, Lawrence SB (2005). Bone morphogenetic protein 15 and growth di_erentiation factor 9 cooperate to regulate granulosa cell function in ruminants. Reproduction. 129: 481–487. [CrossRef] [PubMed] Moore RK and Shimasaki S (2005). Molecular biology and physiological role of the oocyte factor, BMP-15. Mol. Cell.Endocrinol. 234: 67-73. Mullen MPHJ, Howard DJ, Powell R (2013). Investigation of prolific sheep from UK and Ireland for evidence on origin of the mutations in BMP15 (FecXG, FecXB) and GDF9 (FecGH) in Belclare and Cambridge sheep. PLoS ONE. 8. Palai TK, Bisoi PC, Maity A, Behera PC, Sahoo G, Polley S, De S (2013). Prolificacy in Raighar goats is independent of FecB gene. Veterinary World, 6: 479-481. Pamungkas FA, Batubara A, Doloksaribu M, Sihite E (2009). Petunjuk Teknis Potensi Beberapa Plasma Nutfah Kambing Indonesia. Puslitbangnak, Deli Serdang, Sumatera Utara. Pan ZY, Di R, Tang QQ, Jin HH, Chu MX, Huang DW, He JN, Liu QY, Hu WP, Wang XY (2015). Tissue-specific mRNA expression profiles of GDF9, BMP15, and BMPR1B genes in prolific and non-prolific goat breeds. Czech J. Anim. Sci., 60: 452–458. [CrossRef] Polley S, De S, Batabyal S, Kaushik R, Yadav P, Arora JS, Chattopadhyay S, Pan S, Brahma B, Datta TK, Goswami SL (2009). Polymorphism of fecundity genes (BMPR1B, BMP15 and GDF9) in the Indian prolific Black Bengal goat. Small Ruminant Res 85:122–129. [CrossRef] Polley S, De S, Brahma B, Mukherjee A, Vinesh PV, Batabyal S, Arora JS, Pan S, Samanta AK, Datta TK, Goswami SL (2010). Polymorphism of BMPR1B, BMP15 and GDF9 fecundity genes in prolific Garole sheep. Trop. Anim. Health Prod. 42: 985-993. Pramod RK, Sharma SK, Singhi A, Pan S, Mitra A (2013). Differential ovarian morphometry and follicular expression of BMP15, GDF9 and BMPR1B influence the prolificacy in goat. Reprod. Domes. Anim., 48, 803-809. Praveena K, Ramana DBV, Pankaj PK (2017). Booroola Gene (FecB) Polymorphism and its liaison with litter size in indigenous sheep breeds of Telangana, India. J Anim Res., 7:227-31. Ran XQ, Lin JB, Du ZY, Qing C, Wang Jf (2009). Diversity of Bmp15 and Gdf9 genes in White Goat of Guizhou province and evolution of the en-coded proteins. Zoological Research, 30: 593-602. Saleh A, Hammoud M, Dabour N, Hafez E, Sharaby M (2020). BMPR-1B, BMP-15 and GDF-9 genes structure and their relationship with litter size in six sheep breeds reared in Egypt. BMC Res. Notes 13, 215. [CrossRef] [PubMed] Seo D, Bhuiyan MSA, Sultana H, Heo JM, Lee JH (2016). Genetic divesity analysis of South and East Asian duck populations using highly polymorphic microsatellite markers. Asian Aust. J. Anim. Sci., 29: 471-478. https://doi. org/10.5713/ajas.15.0915 Sharma L, Kuralkar SV, Sajid Ali S, Bankar PS, Prajakta K (2016). Polymorphism Study of BMPR- 1B and BMP-15 Genes in Berari Goats. Ind.J.of Small Rum. 22(2): 230-233 Shokrollahi B and Morammazi S (2018). Polymorphism of GDF9 and BMPR1B genes and their association with litter size in Markhoz goats. Reprod. Domest. Anim., 53: 971–978. [CrossRef] Talebi R, Ahmadi A, Afraz F, Sarry J, Woloszyn F, Fabre S (2018). Detection of single nucleotide polymorphisms at prolificacy major genes in the Mehraban sheep and association with litter size. Ann. Anim. Sci., 18(5): 685-698. Wang W, La Y, Zhou X, Zhang X, Li F, Liu B (2018). The genetic polymorphisms of TGFβ superfamily genes are associated with litter size in a Chinese indigenous sheep breed (Hu sheep). Anim. Reprod. Sci., 189:

19-29. Wang Y, Li Y, Zhang N, Wang Z, Bai J (2011). Polymorphism of Exon 2 of BMP15 Gene and Its Relationship with Litter Size of Two Chinese Goats. Asian-Aust. J. Anim. Sci., 24(7):905-911 Wen YL, Guo XF, Ma L, Zhang XS, Zhang JL, Zhao SG, Chu MX (2021). The expression and mutation of BMPR1B and its association with litter size in small-tail Han sheep (Ovis aries), Arch. Anim. Breed., 64: 211–221, https://doi.org/10.5194/aab-64-211-2021 Wilson T, Wu XY, Juengel JL, Ross IK, Lumsden JM, Lord EA, Dodds KG, Walling GA, McEwan JC, O'Connell AR, McNatty KP, Montgomery GW (2001). Highly prolific Booroola sheep have a mutation in the intracellular kinase domain of bone morphogenetic protein IB receptor (ALK- 6) that is expressed in both oocytes and granulosa cells. Biol. Repr., 64:1225–1235. Yang CX, Zi XD, Wang Y, Yang DQ, Ma L, Lu JY, Niu HR, Xiao XL (2012), Cloning and mRNA expression levels of GDF9, BMP15, and BMPR1B genes in prolific and non-prolific goat breeds. Mol. Reprod. Dev., 79(1): 2. doi:10.1002/mrd.21386 Zhang CS, Geng LY, Du LX, Liu ZZ, Fu ZX, Feng MS, Gong YF (2011). Polymorphic Study of FecX , FecG and FecB mutations in four domestic sheep breeds in the lower yellow river valley G H of China. J. Anim. Vet. Adv., 10(17): 2198- 2201. Zuo B, Hongguang Q, Ziyu W, Xu W, Noor N, Aierdin B, Shijia Y, Xiaolong H, Changhai G, Zhiqin G, Feng W (2013). A Study on BMPR-IB Genes of Bayanbulak Sheep. Asian-Aust. J. Anim. Sci., 26(1): 36-42. 1 2 3 4 5 6 8 9 10 11

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your Manuscript in Advances in Animal and Veterinary Sciences is awaiting Editor's decision

1 pesan

Manuscript Handler <info@manuscripthandler.com> 3 Desember 2022 pukul 03.52
Balas Ke: Manuscript Handler <info@manuscripthandler.com>, Researcherslinks <journals@researcherslinks.com>
Kepada: maskur@unram.ac.id

Dear Dr Maskur Maskur,

We have received reviewer's reports or editor's assessments for your Manuscript ID MH20221008051025-R1 with title Association of FecX^G and FecX mutations with Litter Size in Kacang and Boerka Goat in Advances in Animal and Veterinary Sciences.

The manuscript is with Editor to make final decision.

This decision may take some time as it is being discussed with the Editorial Board members. Not hearing the decision on your manuscirpt indicates that the decision is not yet agreed. As soon as the decision is committed, you will be informed.

This email is for your information only and there is nothing for you to do at this moment. We will keep you updated with further information.

Regards,

ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id>

Your article is now fully published in Advances in Animal and Veterinary Sciences

2 pesan

Publisher Researcherslinks <researcherslinks.publisher@gmail.com> 29 Desember 2022 pukul 23.28
Kepada: maskur@unram.ac.id, researcherslinks@gmail.com, mohammedvet1986@gmail.com

Dear Author,

It is our pleasure to inform you that your article is now fully published in Advances in Animal and Veterinary Sciences:

https://researcherslinks.com/journal-details/Advances-in-Animal-and-Veterinary-Sciences/33/current-issue

The journal has recently collaborated with a UK based publisher called ResearchersLinks Ltd, to advance our contents for global distribution. Therefore, the article will be published at www.ResearchersLinks.com. If you have any questions please feel free to contact us.

It is the responsibility of the corresponding author to update all co-authors. We take this opportunity to exploit our social media tools for dissemination of your work and increasing the impact of your research. You can go to the html version of the article and share your article by clicking on either of the social media icons including Twitter, Facebook, LinkedIn etc. Additionally, we request all authors to cite this article where it is appropriate and valuable.

Thank you very much for your contribution in Advances in Animal and Veterinary Sciences and we look forward to receiving your future contributions soon.

Submit next article at: http://manuscripthandler.com/nexus/Advances-in-Animal-and-Veterinary-Sciences

Best wishes,

Editorial Office
ResearchersLinks, Ltd
35 Oxford Road,
Burnley, Lancashire
BB11 3BB
United Kingdom
Email: journals@researcherslinks.com
Tel: +44 (0)1524383621
+44 (0)7733040586
Twitter: @ResearchersLinks
Facebook: https://www.facebook.com/researchers.links.1
LinkedIn: https://www.linkedin.com/in/researchers-links-94a72478
Web: www.researcherslinks.com

Dr. Ir. Maskur M.Si. <maskur@unram.ac.id> 30 Desember 2022 pukul 19.42
Kepada: Publisher Researcherslinks <researcherslinks.publisher@gmail.com>

Dear editorial

There is an error in the information regarding the article processing schedule, namely the date the article was accepted and published (Received | October 08, 2022; Accepted | October 25, 2022; Published | December 20, 2023). Please double-check (attached file) before this article is published.

Best regard

Maskur
[Kutipan teks disembunyikan]

1672301991AAVS_11_1_124-131.pdf
259K