

Effect of orally administrated of cucumber (*Cucumis sativus* L.) seed juice on the performance and carcass parameters of broiler chickens

by Jet Mandey 3

Submission date: 07-Oct-2021 12:03PM (UTC+0700)

Submission ID: 1667525406

File name: of_orally_administrated_of_cucumber_Cucumis_sativus_L._seed.pdf (207.62K)

Word count: 2772

Character count: 14224

PAPER • OPEN ACCESS

Effect of orally administrated of cucumber (*Cucumis sativus* L.) seed juice on the performance and carcass parameters of broiler chickens

9
To cite this article: J S Mandey *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **492** 012025

View the [article online](#) for updates and enhancements.

Effect of orally administrated of cucumber (*Cucumis sativus* L.) seed juice on the performance and carcass parameters of broiler chickens

J S Mandey, F R Wolayan, C J Pontoh and Y H S Kowel

Animal Nutrition Department, Animal Husbandry Faculty, Universitas Sam Ratulangi

E-mail: jetsm_fapet@yahoo.co.id

Abstract. This study was conducted to investigate the effect of cucumber (*Cucumis sativus*) seed juice in drinking water on the performance and carcass parameters of broiler chickens. A total of 200 DOC of broilers were used for the research. The experiment utilized a completely randomized design in arrangement of four treatments. Each treatment was divided into 5 replications (10 birds each) drank from 8 to 35 d. The birds were housed in battery cages with *ad libitum* access to feed and water. The treatments were given cucumber seed juice at different concentrations (0, 10, 20, 30 g per liter water, respectively). During which, feed intake, carcass yield, abdominal fat, giblet, blood LDL-cholesterol and HDL-cholesterol were measured. Data were subjected to the analysis of variance test followed by honestly significant difference test. Results showed that the diet with cucumber in drinking water was significantly decreased abdominal fat percentage, and increased blood LDL-cholesterol, and also feed conversion, but were not affected to final body weight, giblet, the value of blood HDL-cholesterol, and kept the good value of carcass percentage. It can be concluded that cucumber seed juice in drinking water could be acceptable up to 30 g per liter water.

4 Introduction

Cucumber (*Cucumis sativus* Linn.) belongs to the Cucurbitaceae family is widely distributed in the entire world especially in Asia, Africa, and South America. Cucumber is usually served as appetizers or deserts. Also, associated with cooling, healing, soothing, and emollient effects [1].

Cucumbers was not contained a lot of food value, but they built up this lack of nutrients with a variety of healthy substances. They have already used in ancient times to treated diseases, and as a treatment of tropical sprue, an inflammatory-related disease. Their effect of cleansing on the intestines, kidneys, lung, and skins was also have known. They possessed a potency to cure some headaches, bleeding, dizziness, and pale skin. The seeds have been used as anti-fever, demulcent, and antidiabetic in traditional medicine. Seed oil was used in rheumatism [2]. Cucumber also possess potential broad spectrum antimicrobial activity [3]. That the seeds of the plant *Cucumis sativus* has anti-inflammatory effect for the treatment of related diseases [4]. Methanolic extract of cucumber seeds possessed antiulcer potential which could be due to its antioxidant activity [5].

Phytochemical screening of cucumber seeds found the presence of flavonoid, tannin, saponin, and steroid. Quantitative analysis found flavonoid total 0.36% (w/w), phenol total 0.40% (w/w), and tannin 2.82%. Proximate analysis on cucumber seeds were dry matter 90.53%, crude protein 26.68%, crude fat 14.14%, crude fiber 32.27%, Ca 3.024%, P 0.807%, and gross energy 4817.72 Kcal [6].



Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

It has been investigated the anti-inflammatory activity of cucumber using animal models, and the results suggest that the whole fruit homogenate had anti-inflammatory activity and unlike synthetic drugs, had no dose-dependent side effects. This presents cucumber as a functional food for the management of inflammation [7]. Cucumber extract possess antidiabetic effect [15] alloxan-induced diabetic Sprague-Dawley rat [8]. The study of this plant proved that the plant has many important phytoconstituents like glycosides, flavones, terpenoids, phytosterol, saponins and anolignan B, tannins, ellargic acid, glucose, and fructose. These compounds were responsible for many of the pharmacological activities such as antibacterial, antifungal, antidiabetic, cytotoxic, antacid, and carminative activity, hepatoprotective activity, wound healing activities [2].

Heidari et al. [9] reported that aqueous extract of cucumber acts as a hepatoprotective and antioxidant agent. Sharmin et al. [10] reported that the ethanol extracts of Cucurbitaceae family fruits, cucumber, white pumpkin, and ridge gourd has significant antihyperglycemic effects.

Hydroalcoholic (22.5–33.8%) and buthanolic (26.6–45.0%) seed extracts were effective on decreasing blood glucose levels and controlling the loss of body weight in diabetic rats [11]. Chandrasekar et al. [12] reported the effect of cucumber seeds, using two extracts with different polarity to detect the probable anti-hyperglycemic or hypoglycemic activity.

Administration of pectin (5 g/kg body weight/day) from cucumber led to inhibitory effects on protein kinase C activity in the liver of rats. Level of blood glucose was significantly lowered and the level of glycogen in the liver was significantly increased in pectin-administered rats [13]. Saleh et al. [14] suggested that summer shield supplementation has positive effects on growth performance, nutrient utilization, and plasma lipid profiles in broiler chickens. Summer shield is a mixture of seven herbs and contains 35% *Mentha spicata* (spearmint), 15% *Mangifera indica* (mango), 10% *Coriandrum sativum* (coriander), 10% *Cucumis sativus* (cucumber), 10% *Aegle marmelos* (bael), 10% *Centella asiatica* (gotu kola), and 10% *Allium cepa* (onion).

Research on the use of cucumber seed in broiler chickens has never been done, therefore this study aimed to determine the performance and carcass parameters of broiler chickens given cucumber seed juice through drinking water.

2. Materials and methods

The study was conducted using 200 of one-day-old broiler chickens. The treatment was cucumber seeds which were made juice and given through drinking water, with the following treatments arrangement: 0, 10, 20, 30 g cucumber seed juice (CSJ) per liter water, respectively. The treatment began to be given to chickens at 8 day of age, and data collection was carried out for 4 weeks. The diet was corn 47%, rice bran 16%, coconut cake 5%, soybean meal 20%, and fish meal 12%, and the nutrients composition: crude protein 20.07%, crude fiber 4.98%, fat 6.40%, Ca 1.02%, P 0.74 %, and gross energy 4001 Kcal / kg, which was given *ad libitum*. The preparation of cucumber seed juice based on Alom [15]. The fresh leaves were washing, then, cut into small pieces by scissors. Add water at 1:10 ratio, then juice was prepared by blending the leaves with pestle and motor. After that, stored in a refrigerator at 4°C to maintain the active ingredients of juice.

This study used a completely randomized one-way design (CRD) [16] consisting 4 treatments and 5 replications. The variables measured were performance (feed intake, slaughter weight, carcass weight, percentage of carcass, feed conversion, percentage of abdominal fat), giblet (heart, liver, gizzard), and blood lipid profiles. The value of carcass percentage was obtained by comparing the weight of the carcass (g) with the slaughter weight (g) multiplied by 100%. The percentage of abdominal fat was obtained by comparing the weight of abdominal fat (g) with the slaughter weight (g) multiplied by 100%. The liver, heart, pancreas, and empty gizzard weight were recorded. The data was then analyzed using IBM SPSS 24 software.

3. Results and discussion

The use of cucumber seed juice in drinking water and its effect on the performance and carcass parameters of broiler chickens showed in table 1, table 2 and table 3, respectively. Results showed that the diet with cucumber in drinking water was significantly decreased abdominal fat percentage, and increased blood LDL-cholesterol, and also increased the value of feed conversion, but were no affected to final body weight, giblet, and the value of blood HDL-cholesterol and kept the good value of carcass percentage.

Table 1. Effect of cucumber seeds in drinking water on the performance of broiler chickens.

Variables	Treatments				SEM	p Value
	0 ml CSJ	10 ml CSJ	20 ml CSJ	30 ml CSJ		
Feed Intake (g)	2144.64	2048.24	2041.36	2039.78	21.42	0.23
Average Feed Intake (g)	76.59	73.15	72.49	72.85	0.76	0.25
Water Intake (ml)	4285	4298	4279	4290	0.71	0.56
Slaughter Weight (g)	1249.97	1251.20	1273.60	1300.10	14.21	0.59
Weight Gain (g)	1131.89	1137.68	1159.68	1187.78	14.21	0.70
Carcass Weight (g)	764.8	787.4	780.8	798.2	9.07	0.65
Carcass Percentage (%)	66.78	67.60	67.33	67.74	0.34	0.80
Feed Conversion	1.89 ^a	1.80 ^{ab}	1.76 ^{ab}	1.72 ^b	0.02	0.07
Abdominal Fat (%)	2.47 ^a	2.09 ^b	2.05 ^b	1.94 ^b	0.07	0.02

Notes: CSJ = cucumber seed juice.

Windisch *et al* [17] reported that phytochemical compounds may specially enhance activities of digestive enzymes and nutrient absorption. The bioactive compounds in herbs might act similar to antibiotics. This compound reduced the growth of some harmful bacteria in the gastrointestinal tract of broilers. So, this could result in a higher efficiency in the feed utilization, and it could lead to a better feed efficiency [18].

In this research, except for abdominal fat, slaughter weight and carcass yield were not markedly affected by treatments. Dama, *et al.* [19] suggested that some of the active components in herbs affect lipid metabolism through fatty acid transportation. This can increase the lipid utilization and decrease abdominal fat.

Table 2. Effect of cucumber seeds in drinking water on giblet of broiler chickens.

Giblet	Treatments				SEM	p Value
	0 ml CSJ	10 ml CSJ	20 ml CSJ	30 ml CSJ		
Heart (%)	0.46	0.45	0.47	0.49	0.01	0.77
Liver (%)	1.82	1.93	1.95	2.14	0.05	0.17
Gizzard (%)	1.58	1.70	1.74	1.75	0.03	0.10

Notes: CSJ = cucumber seed juice.

In Asian Traditional Medicine several researchers reported that cucumber seed has been found as a suitable functional food for medical purposes such as diabetes, hyperlipidemia, hypertension (as diuretic), gall bladder stones, constipation, and dyspepsia [20–22]. *In vitro* antioxidant assays showed that cucumber contain the significant antioxidant activity. The activity may be due to the presence of carotenoids, phenolic flavonoids, tannins, polyphenols, and lycopene, found in it [23]. All observations support the hypothesis that phytochemical feed additives may favorably affect gut function; however, the number of *in vivo* studies with swine and poultry is still quite limited [24].

Table 3. Blood lipid profiles affected by cucumber seeds in drinking water.

Lipid	Treatments				SEM	P Value
	0 ml CSJ	10 ml CSJ	20 ml CSJ	30 ml CSJ		
Total Cholesterol	118.4	120.4	118.8	112.0	2.29	0.62
LDL-Cholesterol	17.2 ^a	20.6 ^b	29.4 ^c	28.4 ^c	1.28	0.00
HDL-Cholesterol	94.4	99.8	99.0	99.0	0.89	0.13
Triglyceride	29.8	28.2	24.8	24.2	1.07	0.19

Notes: CSJ = cucumber seed juice.

4. Conclusion

It can be concluded that cucumber seed juice in drinking water could be acceptable up to 30 g per liter water

18

Acknowledgement

The author would like to thank to the Ministry of Research, Technology, and Higher Education for providing financial assistance in this research.

References

- [1] Foong F H N, Mohammad A and Ichwan S J A 2015 Biological properties of cucumber (*Cucumis sativus* L.) extracts *Malaysian J. of Analytical Sci.* **19** 1218–22
- [2] Mallik J, Das P and Das S 2013 Pharmacological activity of *Cucumis sativus* L. – a complete overview *Asian J. of Pharm. Res. and Develop.* **1** 2–6
- [3] Sood A, Kaur P and Gupta R 2012 Phytochemical screening and antimicrobial assay of various seeds extracts of Cucurbitaceae Family *Int. J. of Appl. Biol. and Pharm. Technol.* **3** 401–09
- [4] Vetriselvan S, Subasini U, Velmurugan C, Muthuramu T, Shankar Jothe and Revathy 2013 O Anti-inflammatory activity of *Cucumis sativus* seed in carrageenan and xylene induced edema model using albino wistar rats *Int. J. of Biopharmaceutics* **4** 34–7
- [5] Gill N S, Garg M, Bansal R, Sood S, Muthuraman A, Bali M and Sharma P D 2009 Evaluation of antioxidant and antiulcer potential of *Cucumis sativum* L. seed extract in rats *Asian J. of Clinical Nutr.* **1** 131–38
- [6] Mandey J S, Wolayan F R, Pontoh C J and Sondakh B F J 2019 Phytochemical characterization of cucumber (*Cucumis sativus* L.) seeds as candidate of water additive for organic broiler chickens *J. of Adv. Agric. Tech.* **6** 61–4
- [7] Uzuazokaro Mark-Maria A, Okwesili F C N and Chioma A A 2015 Anti-inflammatory activity of *Cucumis sativus* L. *British J. of Pharm. Res.* **8** 1–8
- [8] Antido J W A, Gatil Y L B and Rabajante N A L 2017 Hypoglycemic activity of *Cucumis sativus* extract on alloxan-induced diabetic sprague-dawley rats: A pilot study Lyceum of the Philippines-St. Cabrini College of Allied Med. Res. **2** 12–28
- [9] Heidari H, Kamalinejad M and Eskandari M 2012 Hepatoprotective activity of *Cucumis sativus* against cumene hydroperoxide induced-oxidative stress *Res. in Pharm. Sci.* **7** S936–39
- [10] Sharmin R, Khan M, Akhter M, Alim A, Islam A and Ahmed M 2013 Hypoglycemic and hypolipidemic effects of cucumber, white pumpkin and ridge gourd in alloxan induced diabetic rats *J. Sci. Res.* **5** 161–70
- [11] Minaiyan M, Zolfaghari B and Kamal A 2011 Effect of hydroalcoholic and buthanolic extract of *Cucumis sativus* seeds on blood glucose level of normal and streptozotocin-induced diabetic rats *Iranian J. of Basic Med. Sci.* **14** 436–42
- [12] Chandrasekar B, Mukherjee B, Mukherjee S K 1989 Blood sugar lowering potentiality of selected Cucurbitaceae plants of India origin *Indian J. Med. Res.* **90** 300–05
- [13] Sudheesh S and Vijayalakshmi N R 2007 Role of pectin from cucumber (*Cucumis sativus*)

- in modulation of protein kinase C activity and regulation of glycogen metabolism in rats *Indian J. Biochem Biophys.* **44** 183–85
- [14] Saleh A A, Ijiri D and Ohtsuka A 2014 Effects of summer shield supplementation on growth performance, nutrient utilisation, and plasma lipid profiles in broiler chickens *Veterinari Medicina* **59** 536–42
- [15] Alom F, Mostofa M, Alam M N, Sorwar M G, Uddin J and Rahman M M 2015 Effects of indigenous medicinal plant tulsi (*Ocimum sanctum*) leaves extract as a growth promoter in broiler *Res. Agric. Livest. Fish.* **2** 97–102
- [16] Steel R G D and Torrie J A 1982 *Principles and Procedures of Statistics 2nd Ed.* (London: McGraw-Hill, Book Co, Inc.)
- [17] Windisch W, Shedle K and Kroismayr A 2008 Use of phytogenic products as feed additives for swine and poultry *J. Anim Sci.* **86** E140–48
- [18] Bedford M 2000 Removal of antibiotic growth promoters from poultry diets *World's Poult. Sci. J.* **56** 347–65
- [19] Dhama K, Latheef S K, Mani S, Samad H A, Karthik K, Tiwari R, Khan R U, Alagawany M, Farag M R, Aiam G M, Laudadio V and Tufarelli V 2015 Multiple beneficial applications and modes of action of herbs in poultry health and production - A Review *Int. J. of Pharm.* **11** 152–76
- [20] Aeri Gh D 1982 *Language of Foods 1st Ed* (Tehran: Amir Kabir Public)
- [21] Roman-Ramos R, Florea-Saenz J L and Alarcon-Aquilar F J 1995 Anti-hyperglycemic effect of some edible plants *J. Ethnopharmacol* **48** 25–32
- [22] Amin Gh R 2005 *Popular Traditional Plants of Iran 5th Ed* (Tehran: Tehran University of Medical Sciences Publications)
- [23] Kumaraswamy L 2016 A comparative study on antioxidant activities of three cultivars of *Cucumis sativas* (Linn) *Int. J. of Res. in Biotech and Biochem*
- [24] Francis G, Kerem Z, Makkar H P S and Becker K 2002 The biological action of saponins in animal systems-A review *Br. J. Nutr.* **88** 587–05

Effect of orally administered of cucumber (Cucumis sativus L.) seed juice on the performance and carcass parameters of broiler chickens

ORIGINALITY REPORT

20%

SIMILARITY INDEX

17%

INTERNET SOURCES

12%

PUBLICATIONS

%

STUDENT PAPERS

PRIMARY SOURCES

1	ijnss.org Internet Source	1%
2	www.ijfans.com Internet Source	1%
3	wpsa.com Internet Source	1%
4	Alkasim Kabiru Yunusa, Munir Abba Dandago, Sa'adatu Mukhtar Ibrahim, Nura Abdullahi, Abdulrashid Rilwan, Aminu Barde. " Total Phenolic Content and Antioxidant Capacity of Different Parts of Cucumber (L.) ", Acta Universitatis Cibiniensis. Series E: Food Technology, 2018 Publication	1%
5	www.frontiersin.org Internet Source	1%
6	Renu Sharma, Jasmeet Kour, Gulzar Ahmad Nayik, Mohammed Shafiq Alam, Naveen	1%

Anand. "Chapter 6 Tinda (Praecitrullus fistulosus)", Springer Science and Business Media LLC, 2020

Publication

7 Mucharommah Sartika Ami. "Etnobotani Tumbuhan dalam Makanan Tradisional Pecel di Desa Sumbermulyo Kecamatan Jogoroto Kabupaten Jombang Jawa Timur", SAINTEKBU, 2019

Publication

8 Chang-Song Ri, Xian-Ren Jiang, Myong-Ho Kim, Jing Wang, Hai-Jun Zhang, Shu-Geng Wu, Valentino Bontempo, Guang-Hai Qi. "Effects of dietary oregano powder supplementation on the growth performance, antioxidant status and meat quality of broiler chicks", Italian Journal of Animal Science, 2017

Publication

9 businessdocbox.com

Internet Source

10 www.casestudiesjournal.com

Internet Source

11 www.thefreelibrary.com

Internet Source

12 www.lybrate.com

Internet Source

eprints.uni-mysore.ac.in

13	Internet Source	1 %
14	sinta3.ristekdikti.go.id Internet Source	1 %
15	www.mantraherbal.com Internet Source	1 %
16	digital.library.ksu.edu.sa Internet Source	1 %
17	eprints.skums.ac.ir Internet Source	1 %
18	www.atlantis-press.com Internet Source	1 %
19	Cindy C. Jacob, Jein R. Leke, Cherlie L.K. Sarajar, Linda M.S. Tangkau. "PENAMPILAN PRODUKSI AYAM KAMPUNG SUPER MELALUI PENAMBAHAN JUICE DAUN GEDI (Abelmochus Manihot L. Medik) DALAM AIR MINUM", ZOOTEK, 2019 Publication	1 %
20	Yan, L.. "Influence of essential oil supplementation and diets with different nutrient densities on growth performance, nutrient digestibility, blood characteristics, meat quality and fecal noxious gas content in growerfinisher pigs", Livestock Science, 201003	1 %

21	lpulaguna.edu.ph Internet Source	1 %
22	text-id.123dok.com Internet Source	1 %
23	B. Owens, M.A. Collins, K.J. McCracken. "2004 SPRING MEETING OF THE WPSA UK BRANCH POSTERS", British Poultry Science, 2004 Publication	1 %
24	bmcvetres.biomedcentral.com Internet Source	<1 %
25	www.iaescore.com Internet Source	<1 %
26	potravinarstvo.com Internet Source	<1 %
27	www.japsonline.com Internet Source	<1 %
28	citeseerx.ist.psu.edu Internet Source	<1 %
29	dspace.knust.edu.gh Internet Source	<1 %
30	www.akdcentrevisvabharati.org Internet Source	<1 %

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off