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Perception of the scientist and student's regarding animal cloning

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Abstract

Animal cloning is one of the significant issues that concern veterinarians and animal welfare activists. With the help of biotechnological production systems, the demand for high animal production efficiency has been met. However, it is thought that these are endangering welfare, creating moral and ethical conundrums, particularly for veterinarians. Given the lack of knowledge on this subject, a study was carried out at the Lala Lajpat Rai University of Veterinary and Animal Sciences in Hisar, Haryana, to find out how scientists and students felt about animal cloning. The scientists and students in the sample were chosen at random. A questionnaire was used to gauge the perception, which was conceptualized as a positive or negative inclination toward acceptance of animal cloning. The average response score revealed that respondents had a neutral opinion of scientific animal cloning. With scientists being much more accepting than students, the average response score showed that respondents had a neutral opinion about animal cloning. Animal cloning perception appears to be significantly shaped by veterinary education. The fact that the respondents' opinions don't differ noticeably further supports the claim that cultural and traditional values have an impact. The need for more investigation into the perception-related factors is raised.

Keywords: Animal cloning, perception about animal cloning, scientists

Introduction

The complex process of animal cloning allows researchers to replicate an animal's genetic makeup or inherited characteristics (Vjata and Gjerris, 2006) [22]. Cloning animals presents two distinct moral dilemmas: it may harm animals, people, or the environment, and it may go against fundamental moral precepts or prohibitions. Animal cloning has raised a number of issues, the first of which are "consequentialist" in nature and center on the undesirable outcomes that could be brought about by this technology (Rollin, 1981; Singer, 1975) [18, 20]. Deontological arguments could also be used to criticize it (Regan, 1983) [16]. Concerns about "playing God," the intrinsic value of animals, and the objectification and commodification of animals are ethical issues in this situation.

Diverse viewpoints on the behavior surrounding animal use can be found, even in a specific setting like a university environment. The awareness and attitudes of American consumers toward meat and milk from cloned cattle were studied by Brooks (2011) [2] using a web-based survey run by Knowledge Networks. Consumers do not significantly distinguish between goods derived from cloned and non-cloned animals, according to research. Consumers are worried that human cloning will result from animal cloning because they believe that it is an unnatural process.

In contrast to other professions, veterinarians have a long history. The veterinary profession is currently mired in an ethical conundrum due to its role as interlocutor between people, animals, and nature (pan). However, this role and knowledge (empathic, scientific, and instrumental) were once highly valued by society (Schwabe, 1978) [18]. However, the veterinary profession is currently confronted with an ethical conundrum because it must balance the needs of clients and society with those of the animals. Veterinarians' responsibilities and conflicts of interest are difficult to resolve without careful consideration of ethical issues. However, veterinary ethics committees only address matters related to professional codes of conduct, such as potential malpractice, drug use that is against the law, and deceptive advertising (Fox M.W., 1992) [8]. So, today's crucial question is: How do individuals with similar access to information about the advantages and disadvantages of "animal use" come to opposing conclusions on the subject? The origins of attitudes toward animal use are poorly understood (Arluke, 1988; Paul, 1995) [1, 13].

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In order to ascertain how veterinary students and scientists perceive animal cloning and the variables influencing this perception, the current study was carried out.

Materials and Methods

The study was carried out at Lala Lajpat Rai University of Veterinary and Animal Sciences (LUVAS), Hisar. All of the LUVAS, Hisar's animal scientists were collected as samples. 50 members were randomly selected from that group using a straightforward lottery system. In a similar manner, a sample of 120 students (100 undergraduates and 20 postgraduates) was obtained from the list of undergraduate students in each class (I to V professional year), and 20 students were chosen at random using the earlier method. Similar to this, a sample of post-graduate students was chosen for the study, resulting in a total of 170 respondents. After a thorough review of the available literature and discussion with the faculty, the antecedent variables most likely to influence students' and scientists' perceptions of factory farming were chosen. These included age, gender, educational level, past pet ownership, belief in the animal mind, religiosity, extraversion, conscientiousness, agreeableness, neuroticism, and openness.

Table 1: Shown in Operationalized in the manner

Variables	Operationalization
Gender	Dichotomous
Age	Chronological age of respondents
Experience of pet animals	Schedule was developed
Belief in animal mind	Scale developed by Hills (1995) ^[10]
Religiousness	Scale developed by Hernandez, (2011) ^[9]
Level of education	Schedule was developed
Extraversion	Scale developed by John and Srivastava (1999) ^[11]
Conscientiousness	Scale developed by John and Srivastava (1999) ^[11]
Agreeableness	Scale developed by John and Srivastava (1999) ^[11]
Neuroticism	Scale developed by John and Srivastava (1999) ^[11]
Openness	Scale developed by John and Srivastava (1999) ^[11]

In this study, acceptance of animal cloning was conceptualized as having a positive or negative inclination. A

schedule was created to gauge how respondents felt about animal cloning. The process outlined below was used to create the schedule. Initially, a list of 81 statements expressing opinions on animal cloning was created. These assertions were gathered from a variety of sources, including popular literature, academic publications, public discourse, etc. The statements that were unclear, irrelevant, or did not meet the criteria outlined by Edwards *et al.* (1948) ^[6] were eliminated in the following stage, leaving a list of 52 statements. With clear instructions to carefully and critically evaluate the statements, these were sent to 20 subject matter experts (SMS) at random. They were asked to respond with their opinions regarding whether a specific statement is favorable, unfavorable, or ambiguous. They were asked to add, remove, or modify any statement that they felt befitting of inclusion or deletion. Only 11 of the requested 20 responses were given. The statements that received scores of more than 70% agreement were then kept. The same goes for 29 statements.

The respondent were requested to give responses on three-point continuum scale, i.e. agree, neutral and disagree and the scores 3, 2, and 1 and 1, 2 and 3 were assigned for positive and negative statements, respectively. Thus, the minimum and maximum possible obtainable overall scores were 29 and 87, respectively. The total score of each respondent was worked out by adding the scores of individual statements. The respondents were categorized in three groups of equal range based on their scores. (i.e. less favourable (29-48), favourable (49-67) and strongly favourable (68-87).

Results and Discussion

Background profile of the respondents

The observed age of the entire sample of respondents was 18-58 years, indicating that participants from all age groups were represented in the study (Table 2). The majority of the respondents were male, with only about one-third being female, reflecting the perceived masculinity of the veterinary profession in society. Additionally, a significant portion of the respondents had experience with pet ownership, and they varied in their levels of extraversion, conscientiousness, agreeableness, neuroticism, and openness. In addition, the respondents had moderate belief in animal mind (BAM), which refers to how we attribute to animals' mental abilities like intelligence, the capacity for reason, and feelings of emotion (Hills, 1995) ^[10].

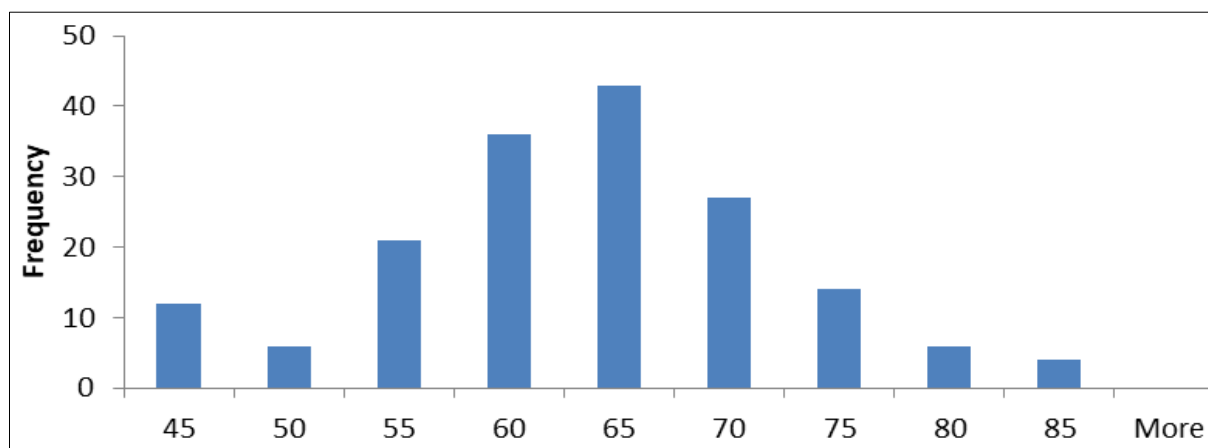
Table 2: Background profile of respondents

Variable	Possible Range	Scientists		Students		Overall	
		Observed Range	Mean± SD	Observed Range	Mean± SD	Observed Range	Mean± SD
Age (years)	-	26-58	40.10±10.62	18-34	22.06±2.32	18-58	27.36±10.22
Gender	0-1	0-1	0.32±0.47	0-1	0.40±0.49	0-1	0.38±0.49
Educational Qualification	1-7	6-7	6.80±0.40	1-6	3.50±1.71	1-7	4.76±2.45
History of pets	1-4	1-4	1.72±0.88	1-4	2.34±1.29	1-4	2.16±1.22
Belief in animal mind	4-28	15-28	22.80±3.58	15-28	21.36±3.58	15-28	21.78±3.63
Religiousness	0-111	0-85	52.18±19.26	0-86	47.78±20.92	0-86	49.07±20.49
Extraversion	8-40	19-38	27.38±4.38	19-39	26.84±3.89	19-39	27.00±4.03
Agreeableness	9-45	29-44	35.64±3.72	20-44	32.49±4.47	20-44	33.42±4.49
Conscientiousness	9-45	24-42	34.46±4.45	21-43	31.12±4.21	21-43	32.10±4.53
Neuroticism	8-40	13-33	22.16±4.91	11-38	22.11±4.83	11-38	22.12±4.84
Openness	10-50	28-43	36.12±3.75	27-45	35.27±3.81	27-45	35.52±3.80

Perception of respondents about animal cloning

The minimum score obtained by the respondents was 36 while the maximum was 84. The average score of all the respondents was 61.18±9.11 (mean ±SD). The frequency distribution is depicted in (Figure 5). The respondents were

categorized in three classes based on scores obtained i.e. less favourable ((29-48)), favourable (49-67) and strongly favourable (68-87). A majority of respondents perceived animal cloning favourably.



Animal cloning score

Fig 1: Histogram depicting frequency distribution of animal cloning score of all respondents

Table 3: Classification of respondents on the basis of perception about animal cloning

S. No.	Level	Students (n=120)		Scientists (n=50)		Total (n=170)	
		Frequency (%)	Mean Score	Frequency (%)	Mean Score	Frequency (%)	Mean Score
1	Less favourable (30-50)	9 (7.50)	43.56	9 (18)	45.11	18 (10.59)	44.33
2	Favourable (51-70)	94 (78.33)	60.70	34 (68)	61.32	128 (75.29)	60.87
3	Strongly favourable (71-90)	17 (14.17)	75.76	7 (14)	74.86	24 (14.12)	75.50

Effect of Respondents Antecedents on Perception toward animal cloning

Age, gender, religion, and beliefs about the intelligence and cognitive abilities of animals were all unrelated to how people

felt about animal cloning. However, respondents' educational backgrounds had a significant influence on how people felt about animal cloning (Table 4).

Table 4: Relationship of Animal cloning and independent variables

Variable	Category (No. of respondent)	Perception about animal cloning				F value
		Less favorable (29-48) Mean ± SD (No. of respondent)	Favorabl (49-67) Mean ± SD (No. of respondent)	Strongly favorable (68-87) Mean ± SD (No. of respondent)	Mean ± SD	
Age (years)	Young (upto 30) 132	44.27±4.22(11)	60.73±4.99(102)	75.26±4.20(19)	61.45±8.71	0.43
	Middle (31-45) 22	43±4.24(4)	61.44±5.63(16)	77±1.41(2)	59.50±10.45	
	Old (Above 45) 16	46.33±1.53(3)	61.40±6.33(10)	76±3.61(3)	61.31±10.68	
Gender	Male 106	44.93±3.81(15)	60.33±5.22(78)	76.08±4.15(13)	60.08±9.40	2.1021*
	Female 64	41.33±3.21(3)	61.70±4.96(50)	74.82±3.68(11)	63±8.35	
Educational qualification	B.V.Sc 1 yr (20)	49.50±0.71(2)	58.07±5.98(14)	73.75±2.63(4)	60.35±8.92	3.57**
	B.V.Sc 2 yr(20)	-	60.26±5.42(19)	73±0(1)	60.90±6	
	B.V.Sc 3 yr(20)	42.83±1.33(6)	61±3.84(14)	-	55.55±9.14	
	B.V.Sc 4 yr(20)	36±0(1)	60.81±3.94(16)	78.67±6.81(3)	62.25±9.88	
	B.V.Sc 5 yr(20)	-	61.20±5.09(20)	-	61.20±5.09	
History of pets	M.V.Sc(30)	47.50±3.54(2)	62.50±4.87(16)	75.33±3.85(12)	66.63±9.18	0.06
	Ph.D(40)	44.43±3.60(7)	61.45±5.74(29)	76±2.94(4)	59.92±9.88	
	No pets 73	46.29±3.90(7)	60.43±5.23(55)	75.64±4.48(11)	61.40±8.87	
	In childhood 38	44.25±5.68(4)	62.42±4.91(31)	73.33±2.52(3)	61.37±8.17	
Variable	In recent past 18	42±1.73(3)	61.36±3.98(11)	75.75±3.77(4)	61.33±11.27	0.4108
	At present 41	42.75±1.71(4)	59.90±5.44(31)	76.17±3.97(6)	60.56±9.61	
	Category (No. of respondent)	Less favorable (29-48) Mean±SD (No. of respondent)	Favorabl (49-67) Mean±SD (No. of respondent)	Strongly favorable (68-87) Mean±SD (No. of respondent)	Mean±SD	
	Low (≤20) 64	49±1(5)	60.73±4.99(52)	76.43±4.76(7)	61.53±7.75	
High (>20) 106	42.54±2.90(13)	60.96±5.28(76)	75.12±3.60(17)	60.97±9.87		
Religiousness	Category (No. of respondent)	Less favorable (29-48) Mean±SD (No. of respondent)	Favorabl (49-67) Mean±SD (No. of respondent)	Strongly favorable (68-87) Mean±SD (No. of respondent)	Mean±SD	0.37
	Low (0-37) 45	44.20±5.17(5)	61.25±4.59(34)	77.67±4.55(6)	61.84±9.49	
	Medium (38-74) 109	44.64±3.56(11)	60.13±5.34(82)	74.94±3.68(16)	60.74±9	
High (75-111) 16	43±4.24(2)	63.67±4.25(12)	73.50±2.12(2)	62.31±9.09		
Extraversion	Category (No. of respondent)	Less favorable (29-48) Mean±SD (No. of respondent)	Favorabl (49-67) Mean±SD (No. of respondent)	Strongly favorable (68-87) Mean±SD (No. of respondent)	Mean±SD	1.0344
	Low (8-24) 47	44.60±3.65(5)	60.32±4.73(38)	77±4.83(4)	60.06±8.47	
Agreeableness	High (25-40) 123	44.23±4.11(13)	61.10±5.32(90)	75.20±3.78(20)	61.61±9.34	0.1213
	Low (9-27) 21	49±0(1)	59.89±4.04(18)	77±5.66(2)	61±7.03	
Conscientiousness	High (28-45) 149	44.06±3.82(17)	61.03±5.30(110)	75.36±3.87(22)	61.21±9.38	1.5371
	Low (9-27) 24	49±1.41(2)	58.85±4.49(20)	72.50±0.71(2)	59.17±6.42	
Neuroticism	High (28-45) 146	43.75±3.70(16)	61.24±5.19(108)	75.77±3.98(22)	61.51±9.45	2.1684*
	Low (8-24) 119	44.20±3.43(10)	61.11±5.31(89)	75.70±4.01(20)	62.14±9.15	
Openness	High (25-40) 51	44.50±4.63(8)	60.31±4.77(39)	74.50±3.70(4)	58.94±8.68	0.9576
	Low (10-30) 18	49±1.41(2)	58.50±6.11(14)	75.50±4.95(2)	59.33±8.60	
Openness	High (31-50) 152	43.75±3.70(16)	61.16±4.97(114)	75.50±3.95(22)	61.40±9.17	0.9576

Cloning and its applications in various fields have been one of the most significant scientific and technological advancements of the twenty-first century (Pardo *et al.* 2002)^[12]. Both social sciences and applied sciences have been drawn to the discussions on cloning practices (Simonneaux *et al.* 2005)^[19]. But the general public's acceptance of animal cloning and its uses involves intricate processes involving societal attitudes and beliefs (Peters *et al.* 2007)^[14]. Animal cloning raises two different kinds of ethical issues: it may harm animals, people, or the environment, and it may go against fundamental moral precepts or principles. Animal cloning's initial set of issues are "consequentialist" in nature and center on the undesirable outcomes that could emerge from this science (Rollin 1981; Singer 1975)^[18, 20]. It is possible to define the negative effects on animals both specifically and broadly. The most severe effect, when viewed narrowly and concentrating on animals used in cloning procedures, is the pain and suffering they go through during the cloning process. More broadly, the detrimental effects of cloning on other populations of animals, such as livestock, unwanted pets, or endangered species, are included in the list of adverse effects on animals (Crosby, 2003)^[4]. The discussion of animal cloning is dominated by numerous arguments. Animal cloning may have a negative impact on people either through the "slippery slope" of developing reproductive cloning methods for humans before doing so for animals, or by jeopardizing the welfare of livestock raised for food (Coleman, 1999)^[3]. Cloned animals may have a negative impact on the environment, whether they are used for agricultural purposes or for conservation purposes. This could happen if they breed with non-clones or if a gene unexpectedly expresses itself in a way that affects the larger ecosystem. Deontological objections to animal cloning are also possible (Regan, 1983)^[16]. In addition, "playing God," the intrinsic value of animals, and the objectification and commodification of animals are all morally dubious. False promises have the potential to be made in the area of pet cloning: bereaved pet owners might be led to believe that cloning will bring their cherished pet back to life, and they might decide to store their pet's DNA without realizing the true costs of cloning when the process becomes commercially feasible. All of these are important ethical questions, some of which deal with the moral acceptability of the science itself and others with problems resulting from the practice or commercialization of the science (Fiester, 2005)^[7].

In the current study, perception of animal cloning was significantly correlated with demographic and personality traits like gender, educational attainment, and neuroticism. Similar conclusions were made by Usak *et al.* (2009)^[21], who looked into the attitudes and knowledge of Turkish university students toward animal cloning. They discovered that female students scored significantly higher than male students. The majority of students approved of the use of cloning-related biotechnology processes, according to a study by Dawson *et al.* (2007)^[5] that looked at how students' attitudes and understandings of the topic have changed over time. However, Prokop, *et al.* (2007)^[15] conducted a study to determine Slovak university students' knowledge of and attitudes toward biotechnology, and the results show that females had statistically significantly more negative responses toward animal cloning than did males.

Conclusion

The findings suggest that veterinary education plays a role in

influencing how people view animal cloning, to sum up. Also indicating the impact of cultural and traditional values is the fact that respondents' opinions did not differ significantly. Research on newly emerging bioethical issues is needed in order to better understand the factors.

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