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On the Extent of Implementing Research Ethics among Animal Scientists at a National University in the Global South

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Abstract

This exploratory study sought to determine the extent of implementing research ethics by animal scientists and how they contribute to improving research productivity in the global south. A cross-sectional survey design using stratified sampling was used. Data were collected from a sample of 93 scientists who had pursued bachelor's, master's, and/or doctoral degrees, or had conducted non-degree research. The study found imbalances by gender, with males pursuing research more than females ($p = 0.046$). Surveys and experimental studies were conducted, rather than reviews ($p = 0001$). There was limited acquisition of informed consent by researchers. No financial inducements were given to respondents. There was limited knowledge of the functions of institutional review boards; however, doctoral researchers had more knowledge than other categories ($p = 0.001$). There were deliberate efforts to handle the cultures of respondents, such as hiring local enumerators. All researchers did not have conflicts of interest, and their funders never interfered with data management and reporting processes. However, the degree of study significantly ($p < 0.05$) influenced the presence of several ethical issues, including guest authors, ghost authors, salami slicing, and bias in authorship assignment. The study recommends capacity building of animal scientists in ethical research processes with a focus on seeking informed consent, respondents' protection, and research ethics committees' roles. Universities should acquire anti-plagiarism software for researchers. Students and academics should build their capacity on ethical issues in publishing research results. Research Ethics Committees at universities should be strengthened to promote mainstreaming of research culture to foster credibility and usability of the findings in community development.

1. Introduction

Researchers in every discipline of human endeavour should always follow research ethics. Ethical considerations lay the foundation for a vibrant research ecosystem that students, academics, and independent researchers in all fields, including natural, biological and social sciences, follow for the good of all (Bhandari, 2021; Congiunti et al., 2023; Magara, 2026; Lunshof & Rijssenbeek, 2023). Research ethics are agreed set of principles that guide the research designs and practices of researchers. Researchers should always adhere to a community of practice—code of conduct in the process of collecting, utilising, and reporting data from people and animals. Although the aims of human and animal research vary, they most often target the comprehension of real-life phenomena, studying how effective different treatments are, exploring behaviours of humans or animals, and overall improvements in their lives. In human and animal studies, for instance, ethical considerations work towards protecting the rights of research participants and subjects (human or animal), enhancing research validity, and maintaining the integrity of scientific research processes (Nguyen & Tuamsuk, 2025).

Research ethics are critical in the advancement of science. It confers integrity and enhances acceptance of scientific output. When human subjects are involved in research, ethics ensure that human rights and associated dignity are sustained and entrenched. Where there are collaborations between science and society, mutual respect between researchers and complementarity build each one's weaknesses and enhance their strengths (Lunshof & Rijssenbeek, 2023). Even in circumstances where research participants are reimbursed for participation, their voluntary participation and dignity are maintained. Dignity is an intangible lifelong asset that no researcher should aim to buy off and take advantage of in the research process. Harm to human or animal participants in a research project/program does not have space a research process (Favaretto et al., 2020). Once research ethics are defied, the credibility of the ongoing research is heavily dented.

In essence, whether results are eagerly awaited by the scientific community, if they arise out of research that violates the dignity of the participating subjects, the results will be scorned (Greene & Master, 2018). The rising cases of research misconduct and retraction of published papers by scientists of repute are a growing concern. Recent studies have reported several cases of scientific misconduct, including fabricating results, plagiarism, denying access to results by competitors, and unwarranted authorship credit, resulting in several cases of retractions, damaging the authors and their affiliated institutions (Teixeira da Silva & Nazarovets, 2025; Van Noorden, 2025).

One of the major hurdles in the research process is the approval process for the planned research. It is of maximum impact for the planned research to be approved, or else the good results can be snubbed and dumped. In most settings, research plans and proposals aiming to work with human and animal subjects are submitted to an Institutional Review Board (IRB) (Capili & Anastasi, 2024) and Institutional Animal Care and User Committees (Diaz et. al., 2021). A core role of the IRB is to verify whether

the planned research and design are ethically acceptable and follow the institution's code of research conduct. IRB checks if the planned research materials and procedures are aligned with current practice and that they will not cause injury or long-term effects on the subjects (Capili & Anastasi, 2024). The approved research plans can be modified by the research team. However, in such circumstances, researchers are required to file for IRB amendments.

In Uganda, our study area, the Uganda National Council for Science and Technology (UNCST) provides oversight to the research process in collaborations with institutions of higher education with approved IRB and RECs (Ochieng et al., 2020). The understanding of the roles of IRBs and RECs, as well as their actual use by researchers, is not documented. The past three decades have seen massive growth in the number of research projects by scientists and academicians, spurred by the growth of several universities and research entities. The drive to publish more has also widely grown, with the now very popular adage, “publish or perish”, and this has also potentially raised the possibility of unethical conduct in research (Teixeira da Silva & Nazarovets, 2025; Van Noorden, 2025). Efforts to domesticate IRBs and RECs by most public universities in Uganda is on the rise, but the extent to which these are being used by researchers is not well understood.

This exploratory research sought to determine the status of understanding of the research ethical considerations and the associated factors. It assessed the extent to which these ethical considerations are made in research project implementation by the Makerere University animal science researchers and how they contribute to improving the research productivity and publication. Specifically, the study sought to answer four objectives, including to:

1. Determine the ethical issues considered by animal science researchers before research commences;
2. Identify the ethical issues between animal science researchers and their respondents in previous research projects;
3. Assess the ethical issues after data collection, its management, and associated issues;
4. Determine if there are any ethical issues relating to the funding and publication of animal science research.

2. Materials and Methods

2.1. Study Location

The study was conducted in the College of Agricultural and Environmental Sciences (CAES) at Makerere University, Kampala, Uganda. Makerere University, one of the premier universities of the global south, started in 1922 as a Technical College and became an independent national University in 1970. Makerere offers undergraduate and graduate studies in a variety of disciplines, and in 2011, became a fully-fledged collegiate university system (Bisaso, 2017). CAES is one of the nine colleges of Makerere University, consisting of three schools, including the School of Agricultural Sciences, Forestry, Environmental and Geographical Sciences; Food Technology, Nutrition and Bio-Engineering (Kugonza, 2024). The college is third in terms of student population, multi-disciplinarity and research output, and offers agricultural programs, Agribusiness and Agricultural Economics, Agricultural Extension, Horticulture, Agricultural Engineering, Food Science and Technology, Nutrition, Forestry, Environmental Sciences, Geography, and Tourism in a total of 14 undergraduate and 28 graduate programs.

2.2 Study Population

The study consisted of a population of 150 student researchers and research fellows who had conducted research projects under the Innovation Hub of the School of Agricultural Sciences in CAES at Makerere University. The researchers who were targeted had worked with various livestock species that are farmed in Uganda. Researchers had all done their work between 2000 and 2020 and originated from Uganda mostly, with a few international students from Burundi, Ghana, Kenya, Rwanda, and the United States of America.

2.3 Research Design, Setting and Study Duration

This study used a cross-sectional survey design, with stratification as a sampling strategy done at the college, school, and department levels. The study adopted a cross-sectional route in which primary data were generated using simple-random sampling to identify respondent researchers who had undertaken work in the discipline of animal science. The interest was in the ethical considerations of animal science researchers, and the study was conducted from March to June 2023.

2.4 Sample Size and Sampling Technique

A sample of 108 animal science researchers who had done studies at the Department of Animal Science was interviewed. The sample size was determined from the formula (1) for determining sample size from a given population (Krejcie & Morgan, 1970).

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)} \quad \text{.....(1)}$$

Where:

S = required sample size; X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841); **N** = the population size, for this study this was 150 researchers; **P** = the population proportion (assumed to be 0.50 since this would provide the maximum sample size); **d** = the degree of accuracy expressed as a proportion, i.e. 0.05. Simple random sampling was used to get the first respondent, considering that the sample size (108) was about three-quarters of the population (150).

2.5 Data Collection Tool

A standard questionnaire was used for the study and was administered by the principal author to avoid interview errors. Each interview lasted for about 30 minutes. The questionnaire was structured and contained almost exclusively closed-ended questions, totalling 46 questions about the subject of research ethics. The tool was constructed in sections. Section 1: Personal information; Section 2: Ethical issues before the research commences; Section 3: Ethical issues during the research; Section 4: Ethical issues when data collection has been completed; Section 5: Privacy of respondents, and restrictions on the use of data; Section 6: Differences in the research context; Section 7: Funding and sponsorship of research; Section 8: Publication and dissemination of research (Kugonza, 2024).

2.6 Data Analysis

Following data collection, responses were coded, classified and keyed into the computer software SPSS version 21. Descriptive statistics, namely: actual observations per variable, frequencies, means, and standard errors, were generated and summarised as descriptives for appropriate deductions and conclusions. Chi-square tests were performed on all major parameters, and significant ones were identified and documented. Mantel-Haenszel's test of independence was performed on the parameters and the associated Chi-square value collated for the indicated variables.

2.7 Limitations

Qualitative analysis of the stories and experiences of researchers as they implemented ethical principles in the research projects in the field was not done, although it could have enhanced the outcome of this research. Fifteen of the sampled researchers declined to participate or only answered very few questions, causing their exclusion from the data set, which dropped from 108 to 93 proper respondents. A general fear of the repercussions of the study results, since some of the respondents are still active in the research and academic domains, and their standing could be compromised by the responses they gave to this survey. Encouraging the respondents and providing them with assurance of confidentiality helped remedy the limitations.

3. Results

3.1 Personal information and characteristics of animal scientists surveyed

Most study respondents (40.9%) were pursuing a Bachelor of Agriculture degree, while others were pursuing graduate degrees. Slightly above a quarter of the study cohort reported on non-degree research work (Table 1). Most research on which responses were based was mostly survey-type, though about 40% reported having done on-farm experiments. Slightly less than one third of the respondents, but a significant proportion (**p = 0.046**) were females. Regarding the country of origin, 86% of the respondents were Ugandans, while the rest were international researchers from Rwanda, Ghana, Kenya, or the United States. Most of the

research studies (36.6%) had been conducted between 2010 and 2014. The species of animals that scientists had worked with were mostly poultry (26.9%).

Table 1
Personal information of animal scientists who participated in the study

Variable	Level	Frequency (n = 93)	Proportion (%)	χ^2 (p-value)
The degree program	BSc. Agriculture (BSc.)	38	40.9	**0.001**
	Master of Science (MSc.)	24	25.8	
	Doctorate of Philosophy	6	6.5	
	Non-degree research	25	26.9	
Research type	Experiment	33	35.5	**0.000**
	Survey	55	59.1	
	Review	5	5.4	
Gender	Female	29	31.2	**0.046**
	Male	64	68.8	
Age	Youth (< 35 years)	42	45.2	0.138
	Adult (> 35 years)	51	54.8	
Country	Rwanda	10	10.8	-
	Uganda	80	86.0	
	Others	3	3.2	
Year	Before 2010	26	28.0	0.260
of research	2010–2014	34	36.6	
	After 2014	33	35.5	
Species of animal	Cattle	19	20.4	
studied	Goats	6	6.5	
	Honey bees	20	21.5	
	Pigs	15	16.1	
	Poultry	25	26.9	
	Environment-related	8	8.6	

3.2 Research and respondent ethical issues before research commences

All respondents who were engaged by the scientists had given consent to voluntarily participate in their studies (Table 2). Consent had been given mostly by verbal communication (59.1%). The proportion of respondents giving verbal consent increased with the passage of time.

Table 2
Proportions (%) reporting on ethical issues before their animal science research was conducted

Variable	Level	Gender		Degree level				Period of study			Total¶
		Female (n = 29)	Male (n = 64)	BSc. (n = 38)	MSc. (n = 24)	Ph.D. (n = 6)	N/degree (n = 25)	< 2010 (n = 26)	2010–2014 (n = 34)	> 2014 (n = 33)	(n = 93)
Consent	Yes	31.7	68.3ns	48.3	23.3	6.7	21.7ns	30.0	31.7	38.3 ns	100 (.922)
Type of consent	Written	4.3	2.2	2.2	1.1	0.0	3.2	1.1	1.1	4.3	6.5
	Verbal	16.1	43.0	30.1	14.0	4.3	10.8	18.3	19.4	21.5	59.1
	NA	10.8	23.7ns	8.6	10.8	2.2	12.9ns	8.6	16.1	9.7ns	34.4 (.140)
Participants gain	Knowledge	17.2	43.0	31.2	10.8	4.3	14.0	19.4	20.4	20.4	60.1
From research	Knowledge & Others§	2.2	1.1	0.0	3.3	0.0	0.0	0.0	0.0	3.3	3.3
	NA	11.8	24.7ns	9.7	11.8	2.2	12.9ns	8.6	16.1	11.8ns	36.6 (.923)
Participation in	Yes	0	1.1	0	0	1.1	0	0	1.1	0	1.1
research design	No	31.2	67.7ns	40.9	25.8	6.5	25.8ns	28.0	35.5	35.5ns	98.9 (.685)
Research was on	Yes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
vulnerable groups	No	31.2	68.8***	40.9	25.8	6.5	26.9***	28.0	36.6	35.5***	100 (-)
Role of the IRB	Approve research	19.4	35.5	4.3	19.4	6.5	24.7	9.7	25.8	19.4	54.8
	Don't know	11.8	33.3ns	36.6	6.5	0.0	2.2***	18.3	10.8	16.1*	45.2 (.475)
Securing permission	Yes	31.2	68.8	40.9	25.8	6.5	26.9	28.0	36.6	35.5	100 (-)
Permission provider	REC	4.3	6.5	0.0	0.0	2.2	8.6	0.0	8.6	2.2	13.0
	IRB	5.4	5.4	2.2	3.3	1.1	4.3	1.1	2.2	7.6	10.9
	NARO Board	6.5	15.1	3.3	9.7	1.1	8.6	8.6	9.7	3.2	21.5
	Graduate Sch. Board	3.2	0.0	0.0	1.1	0.0	2.2	0.0	1.1	2.2	3.2

NA = Not applicable = no response; IRB = Institutional Review Board; REC = Research Ethics Committee

§Knowledge is given along with small tokens such as tablets of soap, dewormer for animals, or semen for inseminating pigs

Pearson Chi-square test p-value within parameter and category, $p < 0.0001$, ***; $p < 0.01$, **; $p < 0.05$, *; $p > 0.05$, ns = not significant

¶Mantel-Haenszel's test of independence chi-square p-value for the respective variable

Variable	Level	Gender		Degree level				Period of study			Total[¶]
		Female (n = 29)	Male (n = 64)	BSc. (n = 38)	MSc. (n = 24)	Ph.D. (n = 6)	N/degree (n = 25)	< 2010 (n = 26)	2010–2014 (n = 34)	> 2014 (n = 33)	(n = 93)
	Dept Committee	11.8	39.8**ns**	36.6	11.8	2.2	1.1***	17.2	14.0	20.4*	51.6 (-)
	Total	**31.2**	**68.8**	**40.9**	**25.8**	**6.5**	**26.9**	**28.0**	**36.5**	**35.5**	**100**

NA = Not applicable = no response; IRB = Institutional Review Board; REC = Research Ethics Committee

[§]Knowledge is given along with small tokens such as tablets of soap, dewormer for animals, or semen for inseminating pigs

Pearson Chi-square test p-value within parameter and category, p < 0.0001, ***; p < 0.01, **; p < 0.05, *; p > 0.05, ns = not significant

[¶]Mantel-Haenszel's test of independence chi-square p-value for the respective variable

When an inquiry was made on how participants gained from the research activity, over 60% reported knowledge alone as the gain; a further 3.3% had, in addition to knowledge, received tangible tokens of washing soap, animal dewormers, or doses for inseminating pigs. Also, 36.6% did not indicate how their respondents had gained from the research work.

Up to 98.9% reported that their participants had not participated in their research design (Table 2). Only slightly above half (54.8%) of all the 93 researchers knew the role of IRB in the research process. All categories of researchers did not know the IRB role except those pursuing PhDs (p = 0.000). Knowledge of the IRB role was significantly (*p = 0.021*) affected by the period of study, with 18.3% in the period before 2010. When the question was paused as seeking permission to conduct their research, all researchers stated that they had got permission from five different entities (Table 2). Slightly over half of them had used department research committees; about one-fifth had used the National Agricultural Research Organisation (NARO) Research Board, most likely for research projects they had funded. Also, about one-tenth were given either by university-based IRBs or RECs. The differences between proportions were significant for degree levels (*p = 0.000*) and periods of study (*p = 0.043*).

3.3 Ethical issues during the research process between the researcher and the respondent

All respondents (100%) reported that their respondents had not recorded the data they gave. All researchers had consented to record the data from their respondents. The consent was either in writing or paper, captured by electronic means such as ODK-enhanced Tablets, or captured as audio transcripts using audio recorders. All the researchers reported that they had given the right to exit from the study at any stage of the research process. Similarly, disclosures of sensitive information had been discussed by all the researchers and counterparts. Interestingly, all the researchers reported that they did not provide inducements for data, and some explained that the token incentives described in the section above were handed out after the data collection process and would not have influenced the respondents in any way. Similarly, none of the researchers reported using unethical ways to extract data from respondents.

3.4 Ethical issues after data collection are completed

All researchers reported that none of their respondents had read through the data collected from them or the entire data set. However, 15.1% had given some form of feedback to their respondents (Table 3). This feedback was in the form of activity reports, laboratory results, copies of degree theses and dissertations, policy briefs, feedback seminars, workshops, and/or conference briefs. Some of the members of the surveyed households had been invited to seminars, workshops, and conferences, and some had recorded appreciation audio-visual messages. Also, most data had been archived by the researchers themselves, while some were stored with the project lead investigator, the student's research supervisors, or the research organisation archives. Some of the data were stored on electronic databases and other media, and the various data disposal methods were affected significantly by the researchers' gender (**p = 0.030**), and the degree of study (**p = 0.012**). Regarding

whether there were any psychological effects of the work of the researchers, it was found that over one third (33.3%) believed there had been no effects, one third did not know if there had been an issue like that, 48.5% did not respond to this concern, and proportions for degree level differed significantly (**p = 0.014**).

Table 3
Proportions of researchers who met ethical requirements after data collection

Variable	Level	Gender		Degree level				Period			Total
		Female (n = 29)	Male (n = 64)	BSc. (n = 38)	MSc. (n = 24)	Ph.D. (n = 6)	Non-degree (n = 25)	< 2010 (n = 26)	2010–2014 (n = 34)	> 2014 (n = 33)	(n = 93)
Respondents read through the data	No	31.2	68.8	40.9	25.8	6.5	26.9	28.0	36.6	35.5	100
Provided feedback	Yes	6.5	8.6 **ns**	6.5	5.4	0.0	3.2 **ns**	3.2	3.2	8.6 **ns**	15.1
Data disposal methods	Researcher archives	18.3	45.2	28.0	17.2	5.4	12.9	20.4	25.8	17.2	63.4
	Research supervisor	4.3	3.2	6.5	1.1	0.0	0.0	0.0	1.1	6.5	7.5
	Project leader	3.2	12.9	5.4	4.3	0.0	6.5	4.3	7.5	4.3	16.1
	Organisation archive	0.0	5.4	1.1	1.1	0.0	3.2	2.2	2.2	1.1	5.4
	ODK server	0.0	1.1	0.0	1.1	0.0	0.0	0.0	0.0	1.1	1.1
	Others	5.4	1.1 **ns**	0.0	1.1	1.1	4.3 **ns**	1.1	0.0	5.4 **ns**	6.5
Psychological effects of your previous	None	11.8	21.5	12.9	7.5	0.0	12.9	8.6	11.8	12.9	33.3
	I do not know	7.5	22.6	18.3	6.5	4.3	1.1	10.8	8.6	10.8	30.1
Research	No response	11.9	36.6 **ns**	9.7	11.9	2.2	12.9 *****	8.6	16.1	11.9 **ns**	48.5

Pearson Chi-square test p-value within parameter and category, p < 0.0001, ***; p < 0.01, **; p < 0.05, *; p > 0.05, ns = not significant

Table 4
Proportions of researchers who consider the privacy of and limits on data

Variable	Level	Gender		Degree level				Period			Total
		Female (n = 29)	Male (n = 64)	BSc. (n = 38)	MSc. (n = 24)	PhD (n = 6)	Non-degree (n = 25)	< 2010 (n = 26)	2010–2014 (n = 34)	> 2014 (n = 33)	(n = 93)
Ensure respondent anonymity	Yes	5.4	12.9	4.3	6.5	0.0	7.5	5.4	9.7	3.2	18.3
	No	11.8	31.2	26.9	7.5	4.3	4.3	12.9	11.8	18.3	43.0
	No response	13.0	24.7 **ns**	9.7	11.9	2.2	15.1**	9.7	15.1	14.0 **ns**	38.7
How anonymity is ensured			**ns**				**ns**			**ns**	
Confidentiality in data collection	Yes	31.2	68.8	40.9	25.8	6.5	26.9	28.0	36.6	35.5	100

Pearson Chi-square test p-value within parameter and category, p < 0.0001, ***; p < 0.01, **; p < 0.05, *; p > 0.05, ns = not significant

3.5 The privacy of respondents and restrictions on the use of data

Only 18.3% (Table 4) of the study participants had ensured respondent anonymity. Anonymity was ensured by avoiding writing identifiable data, such as research respondents' names, telephone numbers, house identification, or specifying names of product brands that were analysed or compared in different experiments. The reasons for not ensuring anonymity by this group include a requirement by the respective research supervisors to verify that the research was actually done, and the need for feedback in case some information was found to contradict during analysis. More females ensured anonymity than males. Ensuring anonymity was not influenced by the passage of time over the period in question; there is no clear trend, either an increase or a decrease in the proportion of researchers that had ensured anonymity. Interestingly, too, all PhD studies had not ensured anonymity. Overall, it is poignant that 38.7% of the researchers did not respond to this important question on ensuring anonymity. It is noteworthy that when clarification was sought by asking whether confidentiality is given (even in cases of no anonymity), all respondents (100%) reported that they had ensured confidentiality (Table 4).

3.6 Differences in the research context

Most researchers responded informally, and some said that they used native enumerators because of local language fluency and also belonging to the culture and are known by study households. This aspect makes respondents feel very comfortable giving their data genuinely. Hesitation to formally answer this concern in the research context also implies that it is not a well-appreciated aspect of research. Most researchers grapple with issues of budget and work with economically feasible options while choosing enumerators. Figure 1 (a-e) shows the different categorisations of the responses to how culture and gender contexts are handled. Trends are revealed when the degree being sought, year category, study type, gender of researcher, and their age group are considered.

Figure 1: Ways of managing contexts of culture and gender in animal research

3.7 Ethical issues regarding funding and sponsorship of animal science research

This research study inquired about the presence of a conflict of interest in the 93 research projects that responded to this study. There was no evidence of conflict (Table 5, Fig. 1). Likewise, all the researchers reported that their funders had not edited their respective research reports (Table 6).

3.8 The publication and dissemination of research results: ethical issues

All the 93 research studies had been published as dissertations, theses, project reports, and/or as journal articles and conference proceedings (Table 5). Over 60% of the research publications had been peer reviewed. The status of review was significantly affected by degree level (**p = 0.000**) and period of study (**p = 0.008**). Regarding doing anti-plagiarism checks before research reports were released, only 5.4% of the researchers had done it, and these were either pursuing PhD degrees (**p = 0.037**) or were reporting non-degree research findings (Table 6), as no BSc. or MSc. seeking researchers among those studied had done the anti-plagiarism check. Lack of access to computer software was the sole reason for not doing the check.

A total of 16.1% of the researchers admitted to the unethical act of having guest authors on their publications. This act was influenced by degree level (**p = 0.027**) and period of study (**p = 0.018**). Over 60% reported having never had ghost authors, significantly influenced by degree level (**p = 0.01**) and period of study (**p = 0.003**).

Table 5
Funding and sponsorship ethical issues in animal science research

Variable	Level	Gender		Degree level				Period			Total
		Female (n = 29)	Male (n = 64)	BSc. (n = 38)	MSc. (n = 24)	PhD (n = 6)	Non-degree (n = 25)	< 2010 (n = 26)	2010–2014 (n = 34)	> 2014 (n = 33)	(n = 93)
Conflict of interest	No	31.2	68.8	40.9	25.8	6.5	26.9	28.0	36.6	35.5	100
Funders edit research reports	No	31.2	68.8	40.9	25.8	6.5	26.9	28.0	36.6	35.5	100

Table 6
Ethical issues in the publication and dissemination of animal science research

Variable	Level	Gender		Degree level				Period			Total¶
		Female (n = 29)	Male (n = 64)	BSc. (n = 38)	MSc. (n = 24)	PhD (n = 6)	N/degree (n = 25)	< 2010 (n = 26)	2010–2014 (n = 34)	> 2014 (n = 33)	(n = 93)
Did you publish	Yes	31.2	68.8	40.9	25.8	6.5	26.9	28.0	36.6	35.5	100
Publication peer-reviewed	Yes	18.3	43.0	17.2	16.1	3.2	24.7	18.3	29.0	14.0	61.3
	No	5.4	17.2	18.3	4.3	0.0	0.0	8.6	4.3	9.7	22.6
	In process	7.6	8.6 **ns**	5.4	5.4	3.2	2.2***	1.1	3.2	11.9**	16.1
Anti-plagiarism checks done	Yes	2.2	3.2	0.0	0.0	1.1	4.3	0.0	1.1	4.3	5.4
	No	29.1	65.6 **ns**	40.9	25.8	5.4	22.6**	28.0	35.5	31.2 **ns**	94.6
Reasons for not checking plagiarism	No software	31.2	68.8 **ns**	40.9	25.8	6.5	26.9 **ns**	28.0	36.6	35.5 **ns**	100
Guest authorship	Yes	3.2	12.9	3.2	3.2	1.1	8.6	4.3	8.6	3.2	16.1
	No	15.1	32.3	16.1	14.0	2.2	15.1	14.0	21.5	11.8	47.3
	No response	12.9	23.7 **ns**	21.5	8.6	3.2	3.2*	9.7	6.5	20.4*	36.6
Ghost authorship	No	18.3	45.2	19.4	17.2	3.2	23.7	18.3	30.1	15.1	63.4
	No response	12.9	23.7 **ns**	21.5	8.6	3.2	3.2*	9.7	6.5	20.4**	36.6**ns**
Salami slicing	No	18.3	43.0	17.2	17.2	3.2	23.7	17.2	29.0	15.1	61.3
	Possibly	12.9	2.2 **ns**	23.7	8.6	0.0	0.0*	10.8	7.6	20.4*	38.7
Bias in authorship assignment	No	18.3	45.2	19.4	17.2	3.2	23.7	18.3	30.1	15.1	63.4
	No response	12.9	23.7 **ns**	21.5	8.6	3.2	3.2*	9.7	6.5	20.4**	36.6**ns**
Academic dishonesty	No	18.3	45.2	19.4	17.2	3.2	23.7	18.3	30.1	15.1	63.4
	No response	12.9	23.7 **ns**	21.5	8.6	3.2	3.2*	9.7	6.5	20.4**	36.6**ns**

Pearson Chi-square test p-value within parameter and category, $p < 0.0001$, ***; $p < 0.01$, **; $p < 0.05$, *; $p > 0.05$, ns = not significant

¶ Mantel-Haenszel's test of independence chi-square p-value for indicated variables were not significant, ns; the rest were not computer.

Slightly under two-thirds reported having never done salami slicing of their publications, and the 38.7% were not sure or did not know if they had ever done so (Table 6), significantly affected by degree (**p = 0.017**) and period (**p = 0.016**). Most researchers never had biases in authorship assignments, and a similar proportion had never been involved in academic dishonesty. Whereas no researcher confessed to the four vices: allowing ghost authorship, doing salami slicing of their publications, bias in authorship assignment, and involvement in academic dishonesty, a high proportion of 36–39% of all respondents did not answer these four vices (Table 6, and also see Figs. 2–5).

4. Discussion

4.1 Socio-demographic characteristics of the respondents

Animal science research is vital insofar as our appreciation of animals, their role and performance, and their relationships with their environments. There is undeniable evidence of the role of animals in research in the development of life sciences and medicine over many centuries (Hartung, 2024; Mukherjee et al., 2022). Despite these advances, several ethical issues arise from animal science research, having many sub-disciplines with a diversity of experimental techniques for varying purposes (Kalkan & Kekeçoğlu, 2024). It is paramount that any animal science research endeavour should aim at realistic and achievable improvements of our knowledge on a given animal species insofar as its functioning, productivity, health and welfare are concerned.

The intent of research institutions, such as Makerere University, is to be an equal opportunities institution, without discrimination on grounds of race, colour, sex, religion, status, disability or ethnic origin, and age. Analyses of the socio-demographics of the study respondents presented an unbalanced outcome. Males were a dominant proportion of the study respondents. This imbalance may be a result of the animal science profession being chosen more by men, including progression in graduate degrees in animal sciences (Crepaldi et al., 2025; Payne et al., 2023). The finding that most respondents were pursuing bachelor's degrees, followed by those with Master's degrees, and with doctoral researchers being the least, is aligned with the proportions of admitted and graduating students to the university.

Research by survey-type dominated partly because surveys under Ugandan research conditions cost relatively less than field-based or on-station experiments. Surveys involve more direct interaction between researchers and human subjects (Capili & Anastasi, 2024) and the one for animals focuses on a slightly different paradigm (Diaz et al., 2021; Musoni et al., 2013).

This study reported almost a balanced proportion of youth and adult respondent researchers. This is rather high considering that youth involvement in agricultural-related activities is limited (Geza et al., 2021). Even though the youth targeted by this research endeavour were agricultural graduates, most of these would have diverted to do other "things" once they had accomplished their studies and would not have been available for this study. The year period during which the research was conducted did not affect the proportion of researchers responding to the study. It was expected that recent studies would have been represented by a bigger proportion than the rest; however, the cohort length of five years is probably not long enough to show the proportion of the researcher categories, as well as inequities and low graduate degree awards especially in science that could dictate the pursuit of scientific inquiry in Uganda (Etomaru et al., 2023).

The choice of animal species matters when it is time for the ethical evaluation of animal-based research. It also has implications for hard decisions on whether to use or not use, which comes after determining to what extent a given animal species suffers or experiences frustration and sentience (Browning & Birch, 2022). In this study, most researchers had worked on poultry, predominantly chickens, but cattle and pigs also presented quite proportionate numbers, corresponding with the extensive development in livestock research for African development efforts (Ibeagha-Awemu et al., 2026; Rege et al., 2026; Kugonza and Osei-Amponsah, 2025; Musoni et al., 2013). The high numbers of research on honeybees were a standout; this species has seen a pick-up in terms of interest in the last decade at the national, regional, and international levels (Ebuu et al., 2023; Kugonza, 2022).

4.2 Evaluation of the research's ethical considerations before the research

The process and tips on how to obtain informed consent for research have been expressed by Laurijssen et al. (2022). Although it mainly relates to human health research, it is also applied in sociology research, with human subjects as the focal to outcome measurement. There is also a need to capacitate animal scientists to ensure they obtain written consent and not assume that verbal consent is appropriate.

It has been documented that participants with low human and social capital are much less likely to voluntarily engage in a research endeavour when there are no direct benefits to them (Tyldum, 2012); otherwise, the outcomes are biased. Indeed, payments and incentives in research activities that involve human participants are associated with participation and retention (Largent et al., 2022). This research endeavour reports on research studies that provided an incentive in the form of knowledge (printed or verbal), and very few studies gave washing soap, animal dewormer drugs, or semen doses for artificial insemination. No farmer was given money, which most studies on participant payment are focused on. Financial payments to be acceptable should fit within two categories, namely: reimbursement or compensation.

The lack of knowledge of Institutional Review Boards (IRBs) is not unique to the current study (Table 4). The IRB is mandated to review and monitor the research process that involves humans to ensure their rights are protected (Capili & Anastasi, 2024). There have been efforts to domesticate IRBs in Ugandan research institutions. In 2023 alone, two Research Ethics Committees (RECs) were inaugurated at Makerere University. These IRB developments and efforts to capacitate academic staff and the student body will go a long way to increase the understanding of the role of IRBs. Professional development of the RECs members will be fundamental to improve their competencies in reviewing research protocols, which was found to be a challenge in Uganda (Ainembabazi et al., 2021). Globally, issues of absence of membership diversity, shortage of resources, inadequate training of members, and overall inadequacy in capability to review and monitor research studies were identified as hurting the IRB review processes (Silaigwana & Wassenaar, 2015). This scenario means having the committees in place is part of a journey whose destination is to have competent ethical reviews serving the broad range of scientists.

4.3 Ethical concerns between the researcher and the participant during the research process

It was exhilarating that this study found that researchers had not recorded data of their subjects (Table 4). All the researchers who were the subject of this study had got consent to get the data for their respective research projects. It was also quite exciting to note that all researchers had given clear rights to their respondents to exit from their studies at any stage. This aspect of the study process is usually challenging to give up, considering that a lot of investment has been made into the task. The fact that no inducements were given to research participants by all 93 researchers was quite an important outcome. These findings corroborate those of Tyldum (2012), who states that respondents of low human and social capital, such as those engaged by the 93 researchers, are much less likely to voluntarily engage in a research endeavour when there are no direct benefits to them.

4.4 Ethics of research in the post-data collection phase

It is sometimes surmised that once the data-collection part of the research has been accomplished, then the major ethical issues are done (Capili & Anastasi, 2024). Several issues that arise include respondents who ask for access to questionnaires filled out by other respondents. It becomes unethical for researchers to pass on data provided by one respondent to another. This ethic also applies to audio, video, pictorial drawings, and all forms of information generated from one party and considered private and only for the purpose of the study at hand. The cornerstone of post-data collection includes the de-identification of respondents during the production of reports. In this study, 18.3% (Table 5) of the researchers ensured the anonymity of their respective respondents. The study nevertheless found that even where anonymity was not ensured, confidentiality was always given, which encourages objectivity throughout the research continuum.

Confidentiality is strongly connected to privacy, and whereas privacy is not a fundamental moral right, it is very important in the research context. The entire continuum of confidentiality-privacy-confidentiality is very much part and parcel of the prior informed consent (Capili & Anastasi, 2024). The process starts with the researcher having a statement on who will have access

to the data collected; who will read and scrutinize data, and who will retain the data. Promising that all data will be aggregated helps in cases of quantitative studies and the use of pseudonyms in qualitative studies.

4.5 Ethics of research regarding differences in a research context

In this study, researchers handled differences in research context by avoiding sensitive questions or giving assurances to respondents, while several declared that they did not know how to handle context issues. Differences between the culture of the participants and the researcher potentially involve dimensions such as values and attitudes, social customs, religious beliefs, ethnicity, gender, language, employment patterns, and education level. All these features are causes of concern regarding ethical issues in research. Whereas we endeavoured to discern the contextual issues that would arise in research studies, researchers who were engaged for the data for this study did not give explicit positions regarding how they handle variations in context.

Gender differences between the researcher and participant can sometimes influence how respondents answer. Gender matching between interviewers and respondents has been helpful in improving the quality of research surveys (Hathi et al., 2025). Some cultures and or religions do not allow women to talk to males who are not in family relations. It is prudent in such cases either to have women enumerators conduct surveys with such respondents. No wonder that some studies (e.g. Hathi et al., 2025) have reported that women interviewers have much higher response rates than men, although it is not clear whether it is due to a greater skill or just that respondents prefer women. Elsewhere, female interviewers were found to produce more socially desirable answers (Schmiedeberg & Schröder, 2024). Men have been reported to prefer participating in some studies and not other more risky ones (Otufowora et al., 2021).

Ethnicity and race differences are a serious concern as it widely influences research direction and outcome. Ethnicity is defined by “cultural factors such as nationality, tribal affiliation … and traditions of a particular group” (Santos et al., 2010, p. 121). Race is defined by phenotypic traits such as skin colour, hair type, face and skull shape, and genetic ancestry [e.g., Africans, Caucasians, or Asians] (p. 121). Ethnicity is a complex characteristic of people, and in a research, context raises sophisticated issues (Capili & Anastasi, 2024). In this research, there were researchers who were originating from Rwanda, Kenya, and Ghana and carried out their research in Uganda. Race issues are linked with dissatisfaction with the use of the term, and race is closely linked to genetics and ethnicity.

4.6 Ethical issues regarding funding and sponsorship of animal science research

The relationship between scientists who conduct research and their funders has been described as complex and strewn with conflicts of interest (Krimsky, 2019). Holding the scientists accountable and ensuring transparency rebuilds society’s trust in the integrity of knowledge. The current research found that animal science researchers reported not having had a conflict of interest. They also reported that funders had not engaged in data editing or report editing/influencing. It is important to appreciate that most research is supported by funding that is mostly private, following the submission of competitive bids that are usually competitively graded. Whereas funding sometimes comes from government funding agencies, a significant quantity of it is from research councils, commercial organisations, and international funding corporations and agencies. Funding of research most of the time leads to very desirable outcomes, including the enabling of knowledge advancement, especially for such research endeavours that require significant financing. However, there are some instances when funding may alter the attitude of researchers, partners, or other funders, from ways in which research would have normally been conducted, all with undesirable concerns.

The desire for commercial outcomes from research may override the desire for generating new knowledge, so funders have a thin line along which to tread. These scenarios may compromise research processes and outcomes. It was therefore gratifying that all the 93 researchers engaged in this study expressed no conflict of interest with funders and no direct or indirect involvement of funders in data or report editing. Conflicts of interest between the academic demands of research projects, in several cases, are parallel to funders' viewpoints that tend to zero in on product commercial development. According to Meerabeau et al. (2004), mechanisms of research governance have a key task of research undertaking within an organisation get recorded and forwarded to a central jurisdiction point.

4.7 The publication and dissemination of research results: ethical issues

Results of this study showed that all (100%) researchers surveyed in this study had published their work (Table 6). 'Publish or Perish' has been an adage of many higher education institutions across the globe and, over the past two decades, has truly sparked exponential increases in the number of publications, irrespective of the quality and diversity of the publications (Teixeira da Silva & Nazarovets, 2025; Van Noorden, 2025). Publications are integral in professional development; they have an impact on the creativity, intellectual lives, morale, and psychological status of academic staff as well as bringing attention to scholars and their organisations, attracting more funding and others (Magara, 2026; Semon et al., 2024). Indeed, this aphorism in the academic communities is unprecedented in popularity, though there is a growing dread of it in a few centres of thought.

Whereas it has been reported that a strong association exists between research productivity, as measured by the number of publications in recognised/top journals and their citation counts versus academic affiliation, actual data show that this relationship is thin. Weak, young, private, and general academic institutions that front the number of publications posit highly plagiarised and/or predatory journal publications, and considering numbers/quantity, the trend and or relationships presented above do not arise. The scramble to publish from whatever is within reach is taking more time committed by scholars, leading to the decreased value of scholarship. The uneasiness caused by publish-and-perish severely detracts from scholars' time and effort devoted to teaching undergraduate and higher degree students; after all, the majority of the universities in the global south and north focus more on publications and deliberately have no focus on teaching ability.

Plagiarism could conceivably be carried out with or without intent (Drisko, 2023). It is of concern that researchers do not have access to anti-plagiarism check software in their research institutions (Table 6), that is, if the observed plagiarism is not self-plagiarism or even double publishing (Neill, 2008). Neill (2008) also asks a pertinent question: publish or perish, but at what cost? Also, whether it is ethical to send a paper to a journal when it contains data from a published research study. There is so much temptation to put out there the best expressions and language use, to get acceptance. Indeed, Makerere University will benefit from this software being procured for faculty, staff, and students to have easy and free access so that research work can be scanned and corrected before submission.

Guest authors, ghost authors, salami slicing of publications, having biases when assigning authorship, and involvement in academic dishonesty are all very grave ills in the publication of scientific output (Glendinning & Eaton, 2024). Whereas the results we have reported (see Table 6) are favourable, the very high proportion of non-respondents out of the 93 researchers engaged was disheartening. It could be a symptom of shyness among perpetrators of these heinous publishing taboos. An earlier study on research misconduct found that 53% of doctoral students and 26% of faculty were not likely to report or address misconduct, mainly over the fear of the consequences of doing so (Holaday & Yost, 1993). Capacity building of scientists is hence paramount (Aggrey et al., 2025).

5. Conclusions

This study was undertaken with the quadruple aim of a) determining the ethical issues considered before animal science research commences; b) determining the ethical issues between researchers and respondents in previously implemented research projects; c) assessing the ethical issues after data collection, its management, and associated issues; and d) determining if there are ethical issues relating to funding and publication of animal science research at Makerere University. The study determined that there were gender imbalances between male and female researchers, and there is a skew between the different research categories. There was limited acquisition of informed consent by researchers. There were no financial inducements given to respondents. There were limited knowledge of institutional review boards and their functions. Instead of dodging managing differences due to research context, there should be a deliberate effort to handle differences between the cultures of researchers and respondents. The finding that all researchers did not have conflicts of interest and their funders never interfered with data management and reporting processes.

6. Recommendations

1. Capacity building of animal science researchers to ensure they obtain written consent from their respondents; they are made aware of Institutional Review Boards and their functions; they understand the importance of ensuring anonymity of their respondents.

2. Makerere University should acquire anti-plagiarism software for use by students, faculty, and researchers to refine their proposals, manuscripts, and research reports to comply with the international requirement for publishing.
3. Capacity building of students and academic staff on the ethics of publishing, as there was a low response to questions regarding publication ethics, a likely indicator of existing ethical misconduct in the publication process.
4. Strengthening of Research Ethical Committees and Institutional Review Boards at Makerere University to promote the mainstreaming of research ethics culture.

Declarations

All respondent in this study consented to participate in the study and were free to withdraw from the study at any stage of the study

Competing interests

There is no potential conflict of interest by the authors.

Ethical Statement

This research study was conducted after approval of the Department of Animal and Range Sciences Research and Ethics Committee, School of Agricultural Sciences, College of Agricultural and Environmental Sciences of Makerere University.

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Authors' contributions

This study was conceptualized by DRK and FM. Data was collected and analysed by DRK. The original draft of the paper was written by DRK and FM, with an extensive review by SI. DRK obtained funding for this work from the African Union Commission.

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Availability of data and material

Data used for this publication will be made available on request. It has been deposited with the University database.

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Figures

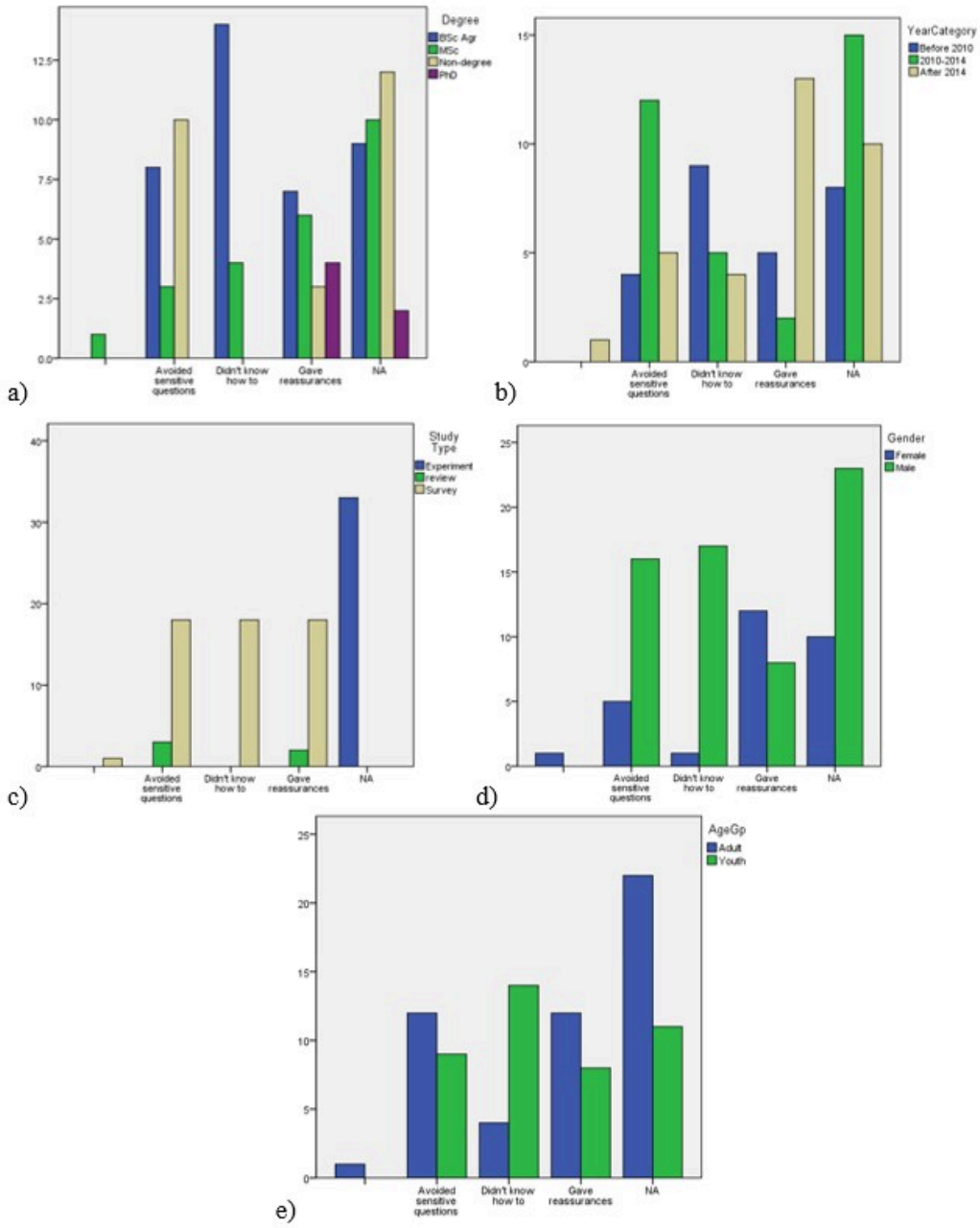


Figure 1

Ways of managing contexts of culture and gender in animal research

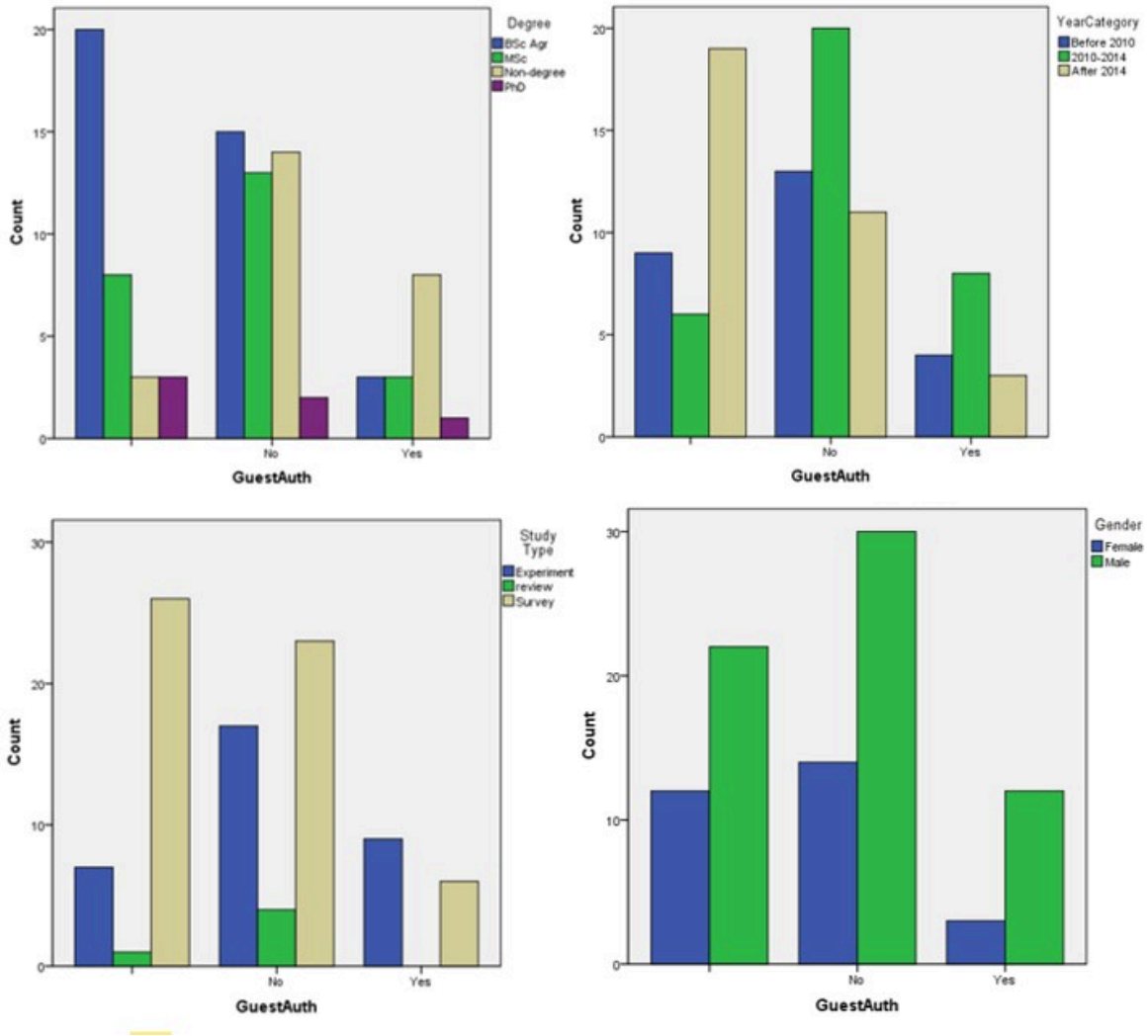


Figure 2

Status of invitation of guest authors to animal science publications

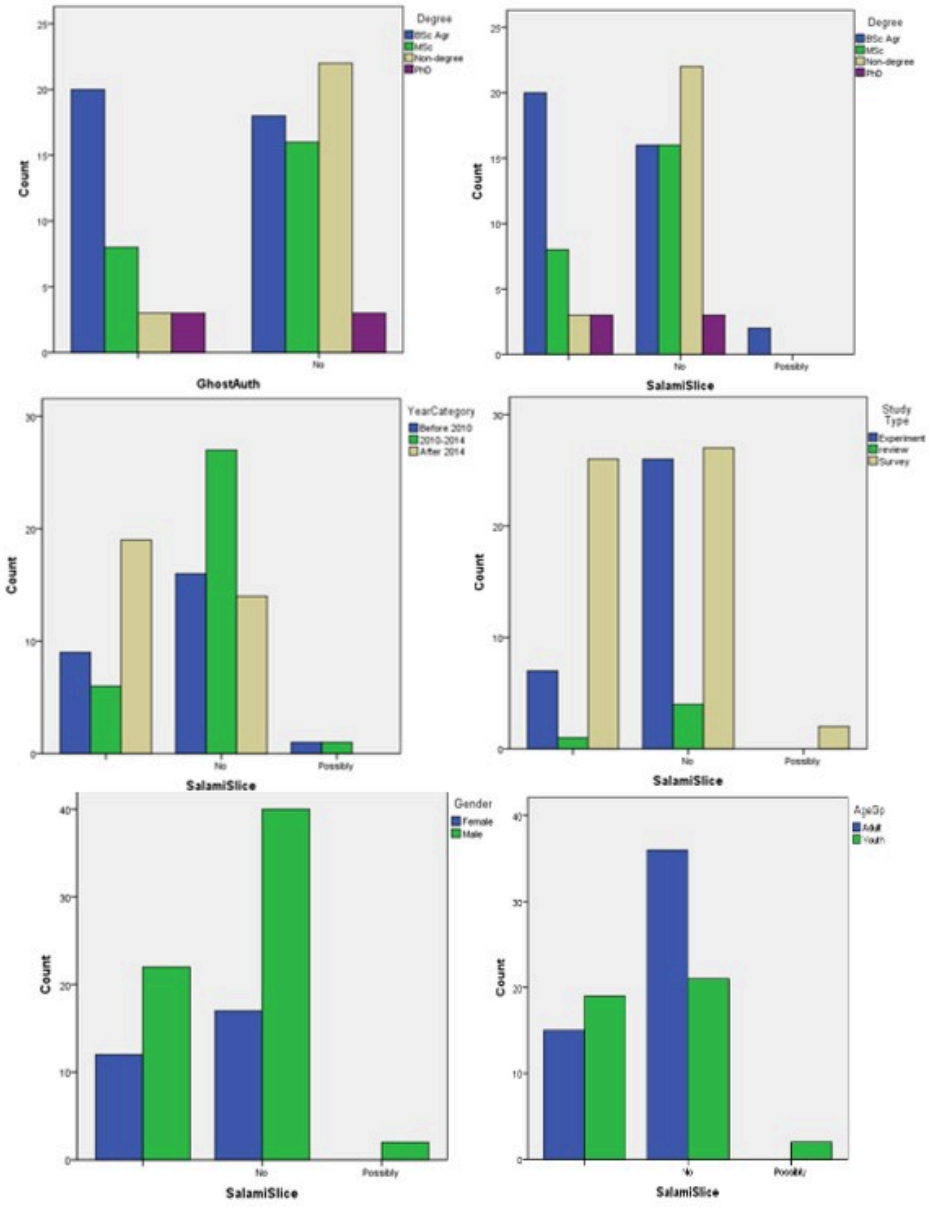


Figure 3

Status of animal science publications: ghost authors, salami slicing

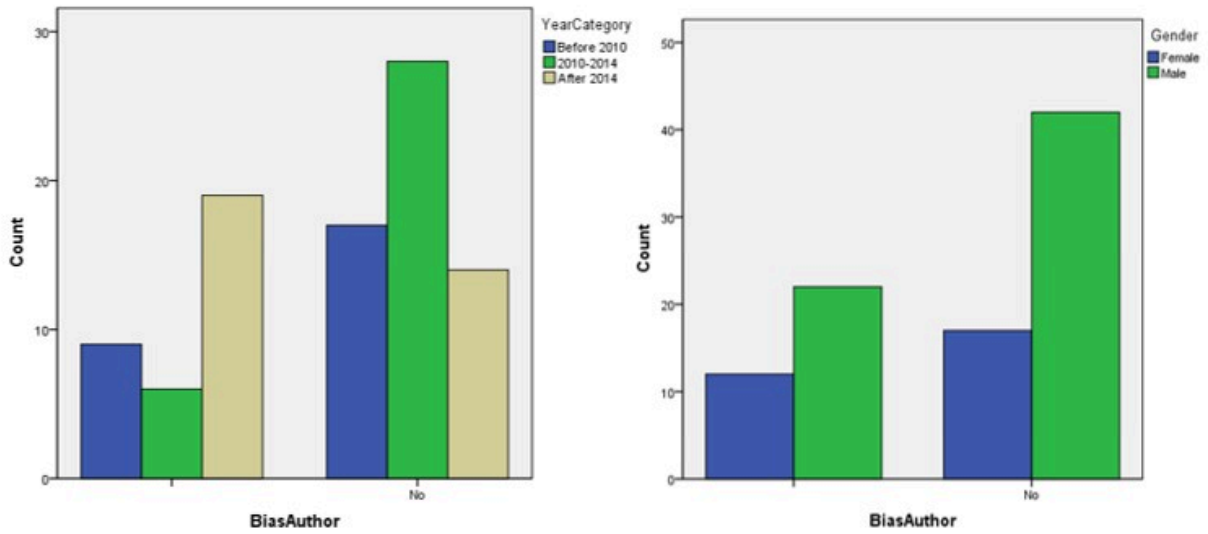


Figure 4

Status of animal science publications: having biased authorship assignment

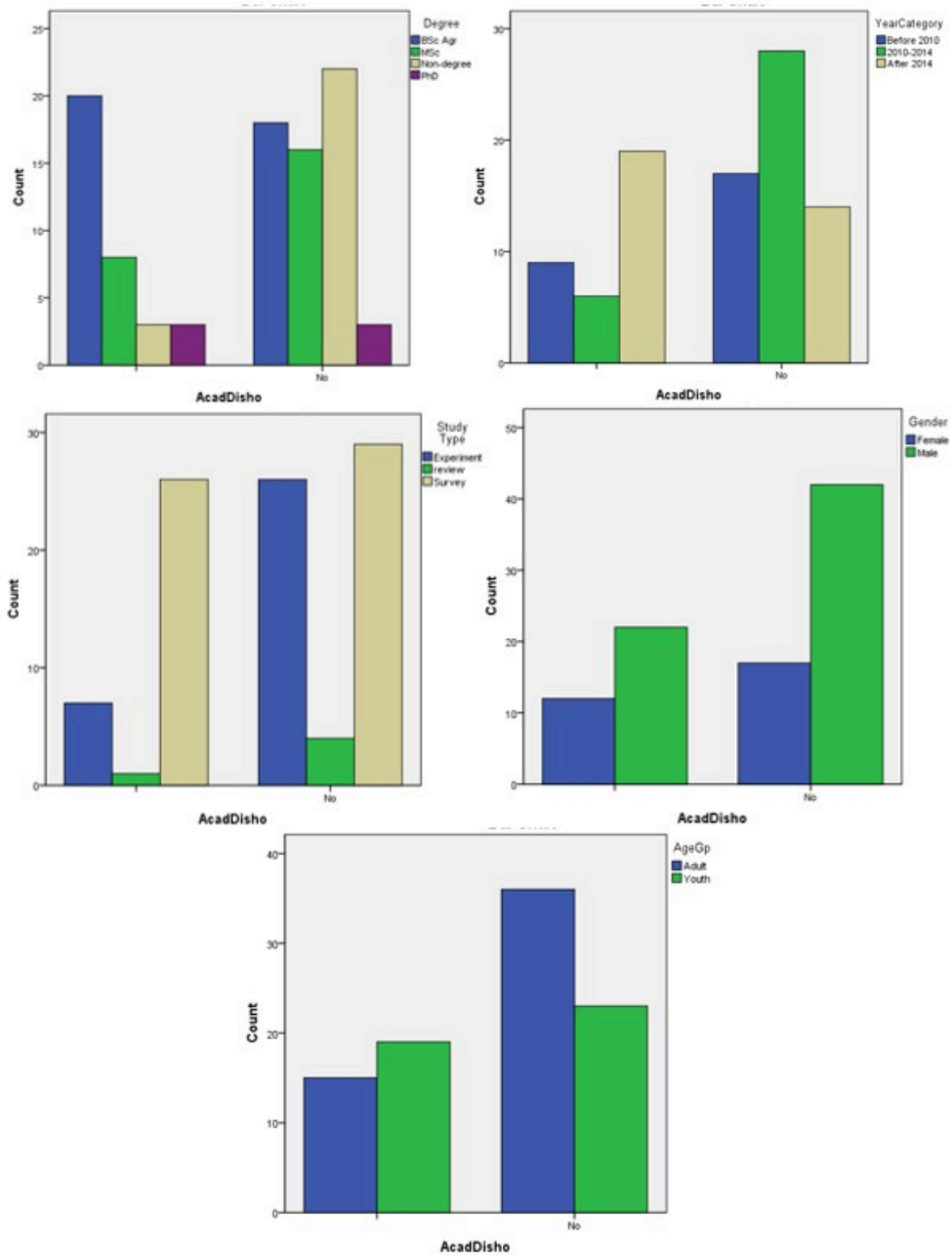


Figure 5

Status of animal science publications: academic dishonesty