

## Original Research Article

# PERCEPTION OF VETERINARIANS TOWARDS CONSEQUENCES AND SUITABILITY OF SEX-SORTED SEMEN TECHNOLOGY

### Abstract

An ex-post-facto exploratory research study was carried out in the state of Andhra Pradesh with the specific objective to know the perception of the veterinarians towards consequences and suitability of sex-sorted sex-sorted semen technology. These consequences include Desirable vs Undesirable, Anticipated vs Unanticipated, Direct vs Indirect and in addition suitability was also assessed in terms of sustainability, compatibility compatibility, socio-cultural and economical-economic aspects. It was found that three-fourth three-fourths of the veterinarians (76.67%) had a medium level of perception towards sex-sorted sex-sorted semen technology in terms of its consequences and suitability to dairy farmers. The study thus, reveals that innovations which that are compatible and in accordance with farmers' situations will be adopted following its diffusion. Consequences and suitability also need to be taken care of while diffusing any innovation among the farming community.

**KEYWORDS:** Consequences, dairy farmers, perception, sex-sorted sex-sorted semen technology, Veterinarians, Andhra Pradesh

### INTRODUCTION

Today, India is the world's largest producer of milk, with 22 per-cent percent of global production which is mainly due to the

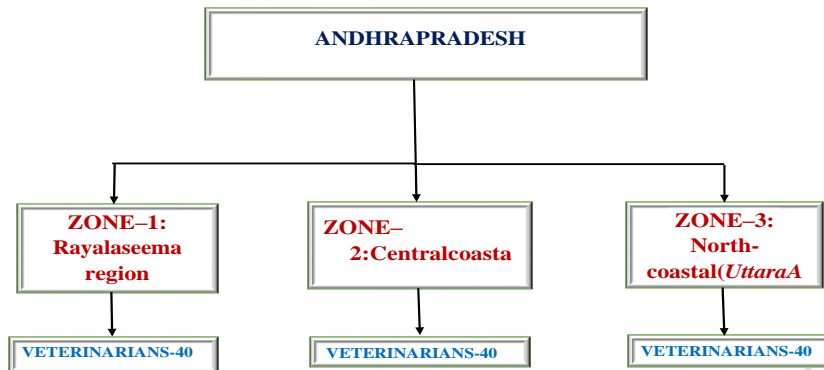
adoption of innovative technologies that are being diffused for adoption by the farmer through different channels. In the recent past, the advanced reproductive technology i.e., [sex—sorted sex-sorted](#) semen technology was diffusing at [an](#) appreciable rate throughout India as its benefits were visible over the years in other countries. [sex sorted sex-](#)  
[sorted](#) semen technology comprises the separation of sperm into male/Y bearing and female/X bearing sperm cells and then artificially inseminating female with the desired sex-sorted semen. Adoption of these advanced reproductive technologies has significant economic value in dairy performance (De Vries *et al.* 2008; Seidel 2014). Farmer's adoption decision of these innovative technologies is affected by a number of demographic and socio-economic factors such as age, education, farm size, experience etc. The field veterinarians who are the middle level extension functionaries also play a major role in the diffusion and adoption of an innovation among the farming community and also their perception and knowledge about an innovation play [a](#) major role in educating and motivating the farmers in taking up that particular innovation. Thus, the perception studies of veterinarians about innovations [helps help](#) to identify the barriers that may face by the farmers. In this regard, the study has been taken up in assessing the consequences and suitability of [sex sorted sex-sorted](#) semen technology to dairy farmers.

## **MATERIALS AND METHODS**

[Stratified—A stratified](#) random sampling method was followed for the selection of the respondents. All ~~the~~ three administrative zones (Rayalseema region, central coastal region, North-coastal (*Uttara Andhra*) region) of Andhra Pradesh were selected for the study and from the three zones together, a total of 120 veterinarians were selected through random sampling with [a](#) confidence level (90%) and Margin of error (10%). The data was collected from the veterinarians by administering [questionnaire—questionnaires](#) through printed and digital forms (Google [forms Forms](#)). Appropriate statistical procedures like frequency,

percentage, mean and standard deviation were employed to analyze and interpret the data.

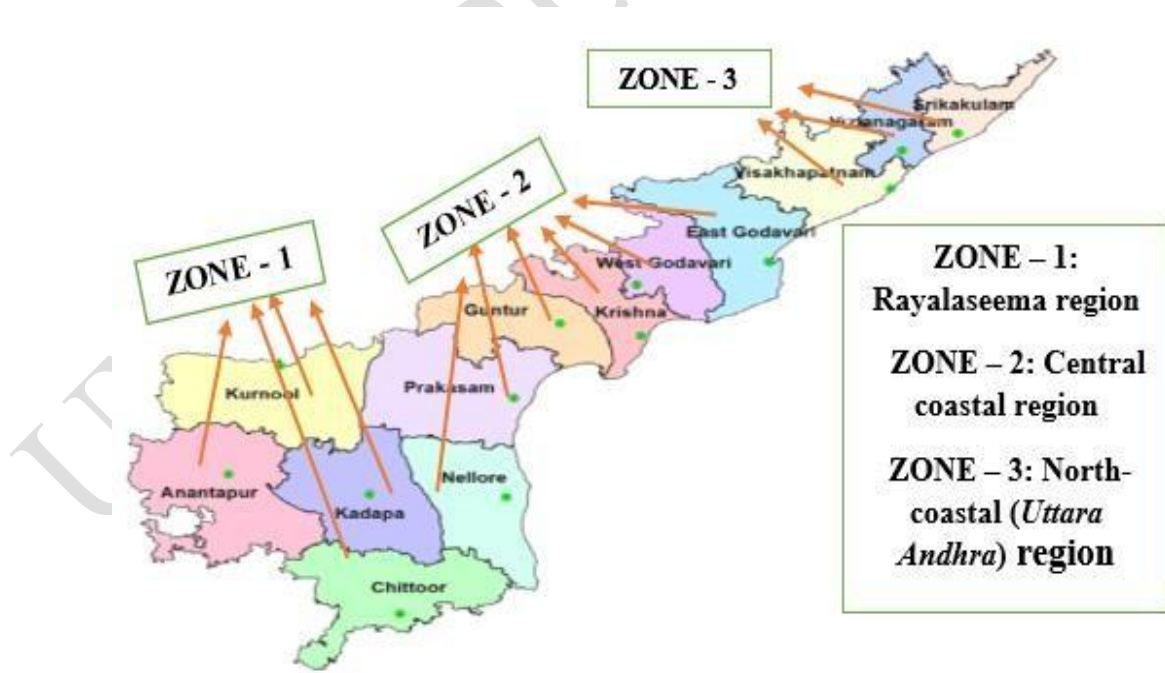
**Fig.1 selection of veterinarians for the study**



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To study the findings related to the perception of veterinarian towards sex sorted sex-sorted semen technology in terms of its consequences and suitability to dairy farmers mentioned above, a schedule was developed consisting of Agree/Disagree type of statements arranged in “18” individual items. The schedule possess-possesses both positive and negative statements with respective scores 1,0 for Agree and Disagree to the positive items and for negative items there reverse way of scoring was followed. Thus, an individual could get a maximum of “18” and a a minimum score of “0”. Based on the scores obtained, perception-perceptions of dairy farmers were categorized into low, medium and high level high-level groups based on mean and standard deviation. The data collected from the respondents were coded, tabulated, analyzed and presented in the form of tables. The inferences were drawn in light of the results obtained, keeping in view the objectives laid in the study.

**Fig.2 Map of Andhra Pradesh showing the three administrative zones selected for the study**



## RESULTS

### Socio-personal, economic and psychological characters characteristics of Veterinarians

Table 1 depicts that [the](#) majority of the veterinarians in the study area belonged to [the](#) old age group and were male. Most of the veterinarians were with graduation and working as veterinary assistant surgeons at veterinary dispensaries. The study also indicated that, [the](#) majority of the respondents had [a](#) medium level of work experience and knowledge (Naidu Baadireddy [2017](#)). The study also revealed that [the](#) majority of the veterinarians did not receive trainings on [sex sorted sex-sorted](#) semen technology.

**Table 1: Socio-personal, economic and psychological characters of veterinarians (N=120)**

Variables	Categories	Frequency(%)	Mean± S.D
Age	Youngage(25-35)	42(35.00%)	
	Middleage(36-46)	29(24.17%)	
	Oldage(47-57)	49(40.83%)	
Gender	Male	90(75.00%)	
	Female	30(25.00%)	
Educational qualification	B.V.Sc&A.H	69(57.50%)	
	M.V.Sc	49(40.83%)	
	Ph.D	02(01.67%)	
Present designation	VAS	65(54.17%)	
	AD	25(45.83%)	
Name of the Working agency	Veterinary Dispensary (VD)	60(50.00%)	
	Area Veterinary Hospital (AVH)	51(42.50%)	
	Others (DLDA)	09(07.50%)	

Experience	Low(<7Years)	33(20.00%)	15.78 ± 9.45
	Medium(7-25)	52(43.33%)	
	High(>25Years)	35(29.17%)	
Trainingsreceived	Trainingsnotreceived	80(66.67%)	
	Trainingsreceived	40(33.33%)	
Knowledge (Scorerange )	Lowlevel (<11.62)	15(12.50%)	12.98 ± 1.36
	Mediumlevel(11.62-14.34)	84(70.00%)	
	Highlevel(>14.34)	21(17.50%)	

The results from the study indicate that 76.67 ~~per cent~~percent of veterinarians had a medium level of perception towards ~~sex sorted~~sex-sortedsement technology in terms of its consequences and suitability to dairy farmers.

**Table 2: Consequences of ~~sex sorted~~sex-sortedsement technology as perceived by veterinarians**

Consequences	Veterinarians(N=120)			
	Frequency (F)	Percentage (%)	TotalFr equency (%)	
<b>A.DesirablevsUndesirableconsequences</b>				
1.Production of only female calves is much desirable	<b>Agree</b>	90	75.00	120
	<b>Disagree</b>	30	25.00	(100.00)
2. <del>Sex sorted</del> Sex-sorted sement technology offers greater genetic distribution	<b>Agree</b>	73	60.83	120
	<b>Disagree</b>	47	39.17	(100.00)
	<b>Agree</b>	56	46.67	

3. <u>Sexsorted</u> <u>Sex-sorted</u> semen technology not suitable to Indian conditions which is mostly mixed farming	<b>Disagree</b>	64	53.33	120 (100.00)
4. Lack of trained technicians affecting sorting and efficiency accuracy	<b>Agree</b>	110	91.67	120
	<b>Disagree</b>	10	8.33	(100.00)
1. High costs and low fertility have limited the use of <u>sexsortedsex-sorted</u> semen technology	<b>Agree</b>	111	92.50	120
	<b>Disagree</b>	09	7.50	(100.00)
<b>B. Anticipated vs Unanticipated consequences</b>				
1. <u>Sexsorted</u> <u>Sex-sorted</u> semen is a revolutionary technology for Indian cattle breeding	<b>Agree</b>	100	83.33	120
	<b>Disagree</b>	20	16.67	(100.00)
2. Well established policies have a positive impact on the adoption rate of sexsorted semen technology	<b>Agree</b>	105	87.50	120
	<b>Disagree</b>	15	12.50	(100.00)
3. Farmers acceptance on <u>sexsortedsex-sorted</u> semen technology is still improving	<b>Agree</b>	106	88.33	120
	<b>Disagree</b>	14	11.67	(100.00)
4. There is a need for standardization of <u>sexsortedsex-sorted</u> semen technology in Indian conditions	<b>Agree</b>	108	90.00	120
	<b>Disagree</b>	12	10.00	(100.00)
<b>C. Direct vs Indirect consequences</b>				
1. Change in <u>the</u> social status of farmers	<b>Agree</b>	79	65.83	120
	<b>Disagree</b>	41	34.17	(100.00)
2. Change in <u>the</u> self-sufficiency of farmers	<b>Agree</b>	92	76.67	120
	<b>Disagree</b>	28	23.33	(100.00)

3. More demand for good quality sex sorted semen born semen-born calves in the market	<b>Agree</b>	89	74.17	120 (100.00)
	<b>Disagree</b>	31	25.83	

**Table 3: Suitability of sex sorted sex-sorted semen technology as perceived by veterinarians**

Suitability	Veterinarians (N=120)			Total Frequency (%)
	Frequency (F)	Percentage (%)		
<b>A. Economic Suitability</b>				
1. Sex sorted Sex-sorted semen technology has the potential to produce a large number of heifers in a herd as compared to using conventional semen	<b>Agree</b>	90	75.00	120 (100.00)
	<b>Disagree</b>	30	25.00	
2. Sex sorted Sex-sorted semen technology meets the scope of increasing milk production	<b>Agree</b>	103	85.83	120 (100.00)
	<b>Disagree</b>	17	14.17	
3. Resources spent on female calf gives better return than on male calf	<b>Agree</b>	107	89.17	120 (100.00)
	<b>Disagree</b>	13	10.83	
<b>B. Sustainability</b>				
1. Sex sorted Sex-sorted semen technology is the most efficient way to increase female population leading to farm sustainability	<b>Agree</b>	111	92.50	120 (100.00)
	<b>Disagree</b>	09	07.50	

**C.Socio-cultural suitability**

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1. Use of <del>sex-sorted</del> <u>sex-sorted</u> semen will not have an effect on <u>the</u> social values/culture/norms of the farmer	<b>Agree</b>	76	63.33	120 (100.00)
	<b>Disagree</b>	44	36.67	
<b>D. Compatibility with needs</b>				
1. Need for female animal over male animal is achieved through <del>sex-sorted</del> <u>sex-sorted</u> semen technology	<b>Agree</b>	109	90.83	120 (100.00)
	<b>Disagree</b>	11	9.17	

Out of the various consequences ~~as~~ expressed by veterinarians with respect to ~~sex-sorted~~ sex-sorted semen technology, though there are desirable consequences like more female calves and improved genetic distribution which fulfill the need of improving milk production (Bhalakiya *et al.* 2018 and Cooke *et al.* 2014), there is need to improve the skills and manpower to further facilitate the adoption of this technology (Khanal *et al.* 2010 and Kumar *et al.* 2016). This may also reduce the cost and improve fertility rate.

Veterinarians were of the opinion that the ~~innovation~~ innovative ~~sex-sorted~~ sex-sorted semen technology will definitely bring revolutionary changes like that of Artificial Insemination (A.I) as it is the most efficient way to increase the female population leading to farm sustainability (Patel and Jethva 2019). In addition, ~~sex-sorted~~ sex-sorted semen technology offers advantages in terms of meeting the scope of increasing milk production, having the potential to produce a large number of heifers in a herd as compared to conventional semen and ~~there by~~ thereby resources spent on female ~~calf~~ calves gives better returns than on male calf (Balzani *et al.* 2020 and Campanile *et al.* 2011). Hence, this technology is more suitable ~~to~~ for Indian farmers who were mostly small and marginal farmers and thereby compatible ~~to~~ with Indian

farmingcommunity(Mallory et al. 2013).

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It was observed from the study that the need for female animal over male animal is achieved through [sexsortedsex-](#)  
[sorted](#)sement technology which was mainly developed to have farmer's choice i.e., female calf (Herbst *et al.* 2009 and Joshi *et al.* 2021).

## CONCLUSION

[SexsortedSex-](#)  
[sorted](#)sement technology is relatively newer and still diffusing [technologiestechnology](#) on dairy farm and is suggested to have a wider adoption and impact in the near future (Weigel, 2004; DeVries *et al.* 2008). Thus, the study reveals that innovations ~~which~~ that are compatible and in accordance with farmers' situations will be adopted following its diffusion. Consequences and suitability also need to be taken care of while diffusing any innovation among the farming community (Bhuva 2014).

### Highlights:

- Field veterinarians in the study area were willing to learn about advanced reproductive technologies like [sexsortedsex-](#)  
[sorted](#)sement technology. Therefore, Periodical [trainingtraining](#) and workshop sessions can be organized at various levels in order to update veterinarians regarding the advanced technologies so that they can enlighten the farmers about ~~its~~ their advantages.
- State Department of Animal Husbandry has to put more efforts in training all ~~the~~ veterinarians to serve the farming community in time to enhance livestock production

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