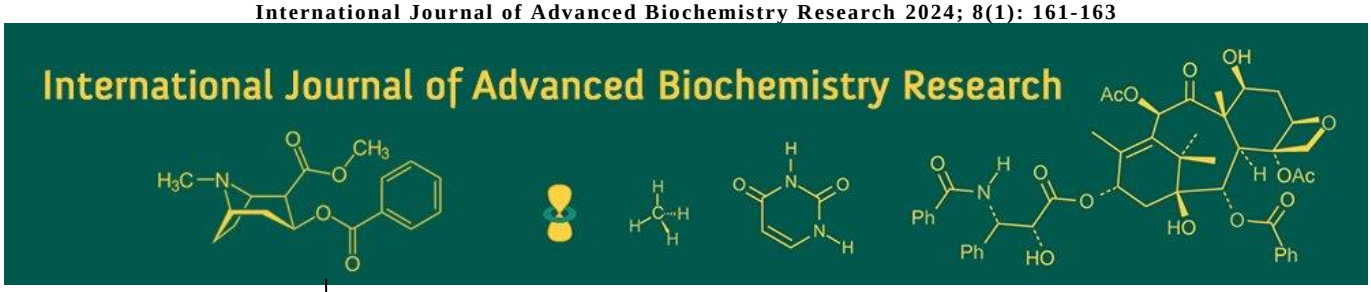

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Efficacy evaluation of anti-inflammatory/antipyretic herbal preparation in cattle

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Abstract
The present investigation was conducted on cattle suffering from fever at Veterinary Clinical Complex, Apollo College of Veterinary Medicine, as well as in animals of individual house holding in Jaipur district of Rajasthan to evaluate the anti-inflammatory and anti-pyretic efficacy of herbal formulation AV/AAC/18 which was provided by M/s. Ayurvet Limited, India. In this trial, a total 30 cattle affected with fever were randomly allocated to control (Group 1) and treatment group (Group T1) having fifteen cattle in each group. Group T1 was treated with injection enrofloxacin @ 5 mg /kg, b.wt., bid, i.m. + AV/AAC/18 @ 50 ml, p. o., bid, till recovery and Group 1 was treated with injection Enrofloxacin @ 5 mg /kg, b.wt., i.m., bid, injection- Melonex plus (meloxicam + paracetamol) @ 1 ml/10 kg b.wt., i.m., bid., till recovery. Various parameters *viz.* rectal temperature, respiration rate, pulse rate, heart rate, rumination frequency, feed consumption per animal were recorded pre-treatment and post-treatment. It was observed that AV/AAC/18 showed comparable therapeutic effect with allopathic drug in management of fever and inflammation in cattle. Looking to the recovery status in rectal temperature, respiration rate, pulse rate, heart rate, rumination frequency, frequency and consistency of dung, feed consumption in treatment group it was concluded that product AV/AAC/18 was efficacious in improving from fever and inflammation and can be used along with antibiotics therapy for management of fever and inflammation in cattle.

Keywords: Cattle, fever, inflammation, herbal drugs

Introduction
Some very poor and marginal communities of India depend on livestock farming as basis of their livelihood mainly for dairying, meat and draught purpose. The overall contribution of livestock sector in total GVA of our country is nearly 4.19 per cent at current prices during 2018-19. According to livestock census (2019), India has 302.79 million bovine populations, out of which 192.49 million are cattle. Rajasthan state has 13.9 million cattle and ranking at 6th position in the country.

Various infectious and non-infectious diseases to animals are major problem in development of socio-economic condition of farmers as they are related to ill health, reduced milk production, low graded milk, disease transmission, veterinary expenses and death of animals. Fever related to various diseases in animals causes decreases in feed intake and growth, and in extreme cases can cause death, resulting in substantial lost revenue to producers. In the past and present, management of fever heavily relied on the excessive use of synthetic drugs as they are fast acting. But, indiscriminate use of these chemicals leads to enhance drug toxicity, a lot of drug residue in animal food products which take long time to withdrawal of active ingredients, undesirable environmental persistence and unacceptable risks to non-target organisms which influencing the normal biotic flora and fauna. Herbal medicines have gained importance due to their less toxicity, lesser side effect and being organic in nature. Even, World Health Organization (WHO) has emphasized on the use of medicinal plants as these are considered safe and effective than the synthetic drugs (Ahmad *et al.*, 2010; Ahmed *et al.*, 2011) [1, 2]. In perspective, the present study was aimed to evaluate efficacy of anti-inflammatory/antipyretic herbal preparation "AV/AAC/18" which was provided by M/s. Ayurvet Limited, India, in cattle.

Materials and Methods

In this study, polyherbal formulations namely "AV/AAC/18" which was provided by M/s. Ayurvet Limited, India, was used to evaluate anti-inflammatory/antipyretic effect of this formulation in fever affected cattle. The investigation was conducted on 30 cattle presented at Veterinary Clinical Complex, Apollo College Veterinary Medicine as well as in animals of individual house holding in Jaipur district with history of fever.

These cattle were divided randomly into two groups, Group 1 (control) and Group T1 (treatment group) having fifteen cattle in each group. Group1 was treated with injection enrofloxacin @ 5 mg/kg, b.wt., i.m., bid, injection- melonex plus (meloxicam + paracetamol) @ 1 ml/10 kg b.wt., i.m., bid. while group T1 was treated with injection enrofloxacin @ 5 mg/kg, b.wt., bid, i.m. +AV/AAC/18 @ 50 ml, p.o., bid, till recovery. Various parameters *viz.* rectal temperature, respiration rate, pulse rate, heart rate, rumination frequency, feed consumption per animal were recorded on day 0 as pre-treatment and on day 1 and day 3 as post-treatment.

Results and Discussion

Pre-treatment (day 0) and post-treatment (day1 and3) mean±SE values of rectal temperature (°F), respiration rate (per minute), Pulse rate (Per minute), heart rate (Per minute), rumination frequency (hour/day), in fever affected cattle are presented in Table 1, Table 2, Table 3, Table 4, Table 5, respectively.

Table 1: Pre-treatment (day0) and post-treatment (day1 and3) mean ± SE values of rectal temperature (°F) in fever affected cattle

Parameter	Day of treatment	Group of cattle		Significance level (t test)
		Group 1 (control)	Group T1	
Rectal temperature (°F)	Day 0	105.08±0.15	104.13±0.14	*
	Day 1	103.39±0.09	103.36±0.09	NS
	Day 3	101.23±0.14	101.06±0.15	NS

*=p<0.05; NS= non-significant

Table 2: Pre-treatment (day0) and post-treatment (day1 and3) mean ± SE values of respiration rate (Per minute) in fever affected cattle

Parameter	Day of treatment	Group of cattle		Significance level (t test)
		Group 1 (control)	Group T1	
Respiration rate (Per minute)	Day 0	39.29±0.98	37.60±1.32	*
	Day 1	32.75±0.73	30.81±1.07	*
	Day 3	23.14±0.46	22.24±0.54	NS

*=p<0.05; NS= non-significant

Table 3: Pre-treatment (day0) and post-treatment (day1 and3) mean ± SE values of pulse rate (Per minute) in fever affected cattle

Parameter	Day of treatment	Group of cattle		Significance level (t test)
		Group 1 (control)	Group T1	
Pulse rate (Per minute)	Day 0	95.37±2.23	97.74±2.35	*
	Day 1	81.76±1.98	84.26±2.19	*
	Day 3	72.53±1.54	73.31±1.35	NS

*=p<0.05; NS= non-significant

Table 4: Pre-treatment (day0) and post-treatment (day1 and3) mean±SE values of heart rate (Per minute) in fever affected cattle

Parameter	Day of treatment	Group of cattle		Significance level (t test)
		Group 1 (control)	Group T1	
Heart rate (Per minute)	Day 0	97.16±2.67	100.05±2.29	*
	Day 1	83.26±1.67	84.37±2.01	NS
	Day 3	74.23±1.46	74.97±1.64	NS

*=p<0.05; NS= non-significant

Table 5: Pre-treatment (day0) and post-treatment (day1 and3) mean ± SE values of rumination frequency (hour/day) in fever affected cattle

Parameter	Day of treatment	Group of cattle		Significance level (t test)
		Group 1 (control)	Group T1	
Rumination frequency (hour/day)	Day 0	0.41±0.09	0.46±0.07	NS
	Day 1	1.89±0.11	2.26±0.09	*
	Day 3	7.60±0.20	8.73±0.23	*

*=p<0.05; NS= non-significant

Pre-treatment (day 0) and post-treatment (day 1 and 3) number fever affected cattle (Group 1 and T1) having different level of feed consumption are presented in Table 6.

Table 6: Pre-treatment (day 0) and post-treatment (day 1 and 3) number fever affected cattle (Group 1 and T1) having different level of feed consumption

Parameters		Groups of cattle	Number of animals (N=15)		
			Day0	Day1	Day3
Level of feed consumption	Good	G1	0	0	12
		T1	0	1	14
	Slightly reduced	G1	0	1	3
		T1	0	2	1
	Moderately reduced	G1	2	6	0
		T1	1	6	0
	Markedly reduced or anorexia	G1	13	8	0
		T1	14	6	0

Pre-treatment data analysis revealed that rectal temperature (°F), respiration rate (per minute), Pulse rate (Per minute) and heart rate (Per minute) were found increased whereas rumination frequency (hour/day) was found decreased in both groups (group 1 and group T1) of fever affected cattle. Level of feed consumption was reduced moderate to markedly in fever affected cattle. Post-treatment (day 1 and day) data analysis revealed that rectal temperature, respiration rate, pulse rate, heart rate, rumination frequency, frequency and consistency of dung, feed consumption turn towards normalcy on day 1 of treatment and were found within normal range on day 3 of treatment in both groups except one cattle in group T1 in which level of feed consumption was slightly reduced on day 3 post-treatment.

Fever in cattle in usually related to various infectious causative agents. Productive animals are more prone to have secondary infections due to reduced immune status or may be due to more chance of metabolic disorders. High temperature load reduces feed consumption and worsens the physiological performance of the animal including increased of body temperature and respiration rate (Ruban *et al.*, 2020; D. Kurniati *et al.*, 2022) [6, 3]. Fever is usually associated with septicemia or inflammation and clinically characterized by inappetence to anorexia, increased heart and pulse rate and loss of production (Radostitis *et al*., 2007) [5].

Conclusion

It was observed that AV/AAC/18 showed comparable therapeutic effect with allopathic drug in management of fever and inflammation in cattle. Looking to the recovery status in rectal temperature, respiration rate, pulse rate, heart rate, rumination frequency, feed consumption in treatment group it was concluded that product AV/AAC/18 was efficacious in improving from fever and inflammation and can be used along with antibiotics therapy for management of fever and inflammation in cattle.

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