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Management of Summer Anestrus In Buffaloes

Kuldeep Singh Gurjar[1], Mansingh[2], Laxmi Yadav[3], Shivani Purohit[4]
M.V.Sc. Scholar[1,3,4] Department of Veterinary Gynecology and Obstetrics
Post Graduate Institute of Veterinary Sciences and Research (PGIVER)
NH- 21 Agra Road Jamdoli, JAIPUR, Rajasthan (302031).
[2]Teaching Associate, Department of Veterinary Gynecology and Obstetrics
Post Graduate Institute of Veterinary Sciences and Research (PGIVER)
NH- 21 Agra Road Jamdoli, JAIPUR
Rajasthan (302031).
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Abstract

Buffalo is an important contributor to milk, meat, draught power and leather production in many developing countries. Heat stress is a well-known problem causing huge economic losses to the buffalo breeders as well as dairy industry, since decades. The thermal stress primarily affects the hypothalamic–hypophyseal–ovarian axis. It is well-accepted that hyper prolactinaemia as a result of thermal stress inhibits the secretion of both FSH and LH at hypophyseal level, which affects various reproductive functions and leads to decrease in reproductive efficiency. Hence heat stress needs to be alleviated by effective management to maintain the reproductive efficiency in buffaloes and prevent economic losses.

Keywords: Anestrus, Buffalo, Heat stress

Introduction

Buffaloes havee immense agricultural importance by virtue of their high production potential through meat and milk for mankind besides being a source of sustenance to the poor and marginal farmers as well as landless laborers in the developing world (Abdolghafour and Sahgir, 2014). Buffaloes can efficiently convert poor quality and fibrous feeds into high quality protein like meat, milk and valuable by-products (Kaneepan et al., 2013). Various climatic factors such as air temperature, solar radiation, relative humidity and their interactions, often limit animal performance. Heat stress is a common problem causing great economic losses to the buffalo breeders as well as dairy industry. Heat stress is the state at which the mechanisms activate to maintain animal's body thermal balance, when exposure to elevated temperature. Increase in environmental temperature resultant in to elevated body temperature and reduction in the gradient between the body and the environment. Though increased environmental temperature is a stressful event presence of ambient humidity is further added in it and trigger a series of changes in the biological functions including depression in feed intake, efficiency and utilization, disturbances in metabolism of water, protein, energy and mineral balances, enzymatic reactions, hormonal secretions and blood metabolites. Such alterations lead to impairment of reproduction and production performances. Heat stress directly affects the breeding efficiency of female buffalo and reduces the intensity and duration of oestrus.

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Causes

1. Environmental factors

In the summer, buffaloes experience anestrus due to a combination of factors including humidity, photoperiod, and ambient temperature. According to reports, breeding efficiency is directly impacted by ambient temperature and relative humidity. Buffalos are highly susceptible to temperature stress due to their weak cutaneous evaporative cooling mechanism and low density of sweat glands, has a direct impact on their neuro-endocrine setup (Razdan 1988).

2. Nutritional factors

In tropical and subtropical regions,high temperatures reduce feed consumption in the summer resultant in reducing the amount of nutrients consumed, dry matter (DM) intake, particularly crude protein,and a negative nitrogen balance. Furthermore, it is reported that in lactating Murrah buffaloes, the digestibility coefficients for both crude protein and DM are much lower in the summer than in the winter (Verma et al. 2000). Dietary stress in cattle modifies the feedback system between oestradiol and LH surge, reducing the susceptibility of follicles to gonadotropins.

3.Endocrine factors

Reproductive effieciency of buffaloes is severaly reduced during late summer months due to heat stress. Sudden increase in body temperture due to heat stress alter reproductive hormones and other physiological systems. Prolactin may influence the seasonal effects on buffalo reproductive and is directly correlated with ambient temperature. Buffaloes have hyperprolactinaemia, which is linked to seasonal variations in pineal metabolism and suggested as a potential reason for summer anestrus.Prolactin disrupts the estrus cycle and fertility by blocking the hypothalamic mechanism that releases LH episodically or by preventing the positive feedback of estrogen on LH secretion. It modifies the quantity of LH receptors for ovarian steroidogenesis at the ovarian level, making the ovaries resistant to the effects of FSH and LH. Additionally, it is stated that in the summer, anestrus buffaloes do not experience the ideal LH surge.Buffaloes frequently experience anestrus linked to low thyroid function in the summer. It has been suggested that high ambient temperature causes hypothyroidism, which in turn reduces the ovary's responsiveness to pituitary gonadotropins, resulting in summer infertility.

4.Management factors

During the summer, management is crucial to the rearing of buffalo. Buffaloes demonstrate weakest estrus, a weakness that is worsened during the heat season.The majority of buffalo exhibit silent estrus throughout the summer, which is defined by less strong and shorter-lasting estrous symptoms further most farmers are unaware of the fact that buffaloes typically show signs of estrus during the night or early morning. Therefore, routine surveillance is not very helpful in detecting buffalo estrus, which causes increased service period in buffaloes during the warmer months.

Strategies to mitigate summer anestrus

There are numerous ways to increase the reproductive efficiency of buffaloes, including breeding, better diet, environmental alteration, managing the nursing process, and hormone therapy.

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1. Management practices

Summer breeding of buffaloes can be successfully completed by altering farm management procedures. This will increase the productivity of rural buffaloes raised in field circumstances. The actual management strategy for this species during the hot summer months is protection from direct sun radiation. This involves providing shade, a loose housing structure, and applying water to the body surface through sprinkling, washing, or wallowing. Research indicates that the presence of showers, in addition to wallowing areas, raises the CR as documented by Di Palo et al. (2009). The negative impacts on fertility and productive efficiency in buffalo during mating are lessened by an extensive and suitable housing system and a change from day to night feeding activities during the summer. Proper deworming also helps in reproductive health.

2. Improving estrus detection methods

Buffalo has a longer time between conception and calving, and one reason for this is poor estrus detection. It has been found that the standard buffalo heat detection methods are not sufficient to identify estrus in the summer. Therefore, it may be more effective to employ an entire male during the colder hours of the day or at night. The best way to identify buffaloes in estrus in the field would be to watch the animal during the night and early morning hours for indications of ovulation. Recall that buffalo exhibit less intense estrous behavior than cows, necessitating close observation of the animal and different management than cows. Buffalo have a less noticeable bellowing and gay mount. Cervical discharge in buffalo heifers is less common and can range from 5 to 25 ml; it should be examined more closely in the early morning.

3. Nutritional management

The feeding plan for buffaloes in hot climates is essential for mitigating infertility issues, particularly summer anestrus. Buffaloes can experience less heat stress if they are provided with night feeding and are only allowed to graze in the morning and late afternoon. Additionally, giving green fodder, silage, or hay, providing unlimited water, and supplementing with a mineral mixture increase the effectiveness of reproduction in the summer. For regular breeding, well-fed buffaloes can be identified in estrus at night in the summer. Buffaloes will experience less heat stress if they are fed roughage at night. In hot weather, there are a few important areas of nutritional management that need to be taken into account. Among these are formulations for lower DM intake, higher nutritional needs in hot weather, increasing dietary heat, and preventing nutrient surplus.

4. Hormonal treatments

To reduce anestrus, increase ovarian activity, trigger or synchronize behavioral estrus, or regulate ovulation, different hormonal treatment plans are implemented (Barile 2005). The effectiveness of using various hormones, either alone or in combination, varies. Inducing ovarian activity in summer anestrus buffaloes was found to be highly effective when progesterone-based treatment regimens (PRID, CIDR, CRESTAR, and progesterone injections) were used alone or in combination with gonadotropins and PGF2α (Neglia et al., 2003).

5. Herbal treatments

Most farmers employ to treat buffaloes during summer time anestrus by combining several locally obtainable resources. Due to the low cost and accessibility of herbals for the treatment of their buffaloes in many circumstances when there are insufficient veterinary services at the village level. The majority of animals (53.33%) overcame anestrus by keeping the male and female together in real life; 45.0% did so by feeding 0.5–1 kg of boiled Bajara (Pennisetum typhoides L.) mixed with Gur (Jaggery) for three days; 38.84% did so by feeding 0.5–1 kg of

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boiled Bajara (Lens esculentamoench); and 30.24% fed 0.5–1 kg of Masurdaal (Lens esculentamoench).in the end,16.30% of buffaloes were able to overcome anestrus after exercising some herbal heat inducer also used for overcome on anestrus like prajana, himfertin, sajani, janova.

Conclusions

One of the main barriers to buffalo reproduction efficiency is summer anestrus, which leads to significant financial losses for both the dairy and buffalo breeding industries. A silent estrus and unsuccessful conceptions are indicative of low reproductive performance in buffaloes throughout the summer. This illness is brought on by a number of dietary, hormonal, and environmental variables as well as management issues. Bad estrus symptoms and infertility are caused by changes in the endocrine environment brought on by high temperatures and humidity as well as longer days. To address summer infertility, sound management is the most effective strategy. Hormonal therapies are another intervention that may be used, but results may vary.

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