THE USE OF WELL-KNOWN, LOW-COST UNCONVENTIONAL FEEDSTUFFS TO BOOST NEONATAL KIDS' GROWTH AND IMMUNITY: A REVIEW

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ABSTRACT: The study comprises the role and use of commonly available non-conventional feedstuffs in the feeding of kids and improving the growth rate and health status of kids and ultimately economizing the feeding cost. Here we have gathered the use of moringa, garlic, azolla and shatavari in feeding of kids. They are a rich source of protein and energy and are available throughout the year. Moringa is a multipurpose plant containing natural antioxidants like Vitamin C, PUFA, flavonoids, tocopherols, other phenolic compounds which enhances the immunity of kids. Garlic contains allicin, an active component which strengthens the immune system and possesses antibacterial, antifungal, and antiviral properties. Azolla contains 25-35% protein, 10-15% minerals, 7-10% amino acid, bio-active substances & bio-polymers, low in fats & carbohydrates. Shatavari is a medicinal plant and herbal galactogogue for safe milk production and neonatal kid growth in order to boost immunity and, eventually, reduce kid mortality.

Keywords: feedstuffs, immune, kids, mortality, protein

Goats are very adaptive and versatile. They can survive in adverse conditions and still provide a good profit. They are the hardiest animals and they are the last to die in times of starvation and drought (Meelet al., 2018).India has the second highest goat population (148.88 million) in the world, which is 27.80% of the total livestock population of India as per 20th livestock census. At the national level, goats account for about 3% of milk output, 14% of meat output, 15% to hide & skin and 9% to livestock GDP (BAHS Annual report, 2019). Kids and lambs are valuable assets for successful small ruminant farming. They are considered very susceptible to infection and neonatal diseases from birth to 6 months of age and suffer higher mortality. At this stage, the passive immunity from damage is not enough, so a good feeding regime is of prime importance for healthy growth of the neonatal. Prices and unavailability of good quality and quantity of feed have always been the main constraints in the growth of neonatalates. So there is always a search of such feed which is available throughout the year and rich in its nutritional composition. Simultaneously, feeding should be cost effective in order to increase the profitability of small ruminant farming. So various unconventional feedstuffs have been reviewed here that can be used in the feeding of neonatal kids.

Moringa Oleifera

It is a multipurpose plant containing natural antioxidants like Vit C, PUFA, flavonoids, tocopherols, and other phenolic compounds (Ramchandran et al., 1980). Its dried leaves can be stored for a long time without any deterioration in nutritive value (Mendieta-Araica et al., 2001). It acts as natural antioxidant (Das et al., 2012), immunomodulation (Waterman et al., 2015) and bio pesticide (Ashfaqet al., 2012). It has 10 times more vitamin A than carrots, 7 times more Vit C than orange, 9 times more protein than yoghurt, 17 times more calcium than milk, 25 times more iron than spinach, 15 times more Potassium than banana (Gopalakrishnanet al., 2016).It has 47% bypass protein (Noumanet al., 2014)and anti-nutritional factors are absent (Bukar, 2010). It produces more biomass per hectare as top feed and gives dry matter yield from 4.2 to 8.3 tons per hectare with a cutting frequency of 40 days interval (Korsoret al., 2017; Meelet al., 2018).Several studies have been undertaken to improve the overall health of children by providing moringa as a supplement, as mentioned here. Damoret al., 2017 provided Moringa leaves at 50% + concentrate and 100% moringa leaves to kids @ 1% body weight and compared them to non-supplemented groups. He discovered that there was an improvement in growth performance without harming the general health of the kids. Meelet al., 2018 investigated feeding different amounts of Moringa (Moringaoleifera) leaves and discovered the same response. Thus, replacing 20-25 percent of poor quality roughage like rice straw with muringa can economize neonatal feeding and enhance feed efficiency (Ahmed and Shaarawy., 2019).The feeding of muringa to the pregnant doe has also been shown to have a carryover effect on the birth weight of kids, with kids born to dams supplemented with muringa having a significantly ($p<0.05$) higher birth weight (Okafor et al., 2021; Ojoawo et al., 2021).

Garlic

Garlic's (Allium sativa) medicinal virtues have been widely recognised and used from ancient times and continue to be so today (Petrovska and Cekovska., 2010).Allicin (allylthiosulfinate, diallyl disulfide-S-monoxide), an active component in garlic, strengthens the immune system and possesses antibacterial, antifungal, and antiviral properties (Tedeschiet al.,

2007).Garlic extract contains antioxidant phytochemicals that protect against oxidant damage by scavenging redox oxidative species, enhancing the cellular antioxidant enzymes superoxide dismutase, catalase, and glutathione peroxidase (Borek, 2001). All of the properties of garlic that have been discussed here are responsible for minimising the risk of diseases in newborns and so enhancing their health status.

Shokrollahi et al., (2016) investigated the effect of garlic extract on the growth, hematology, and cell-mediated immune response of newborn goat kids by supplementing milk with garlic extract. Different groups of goat kids were fed different concentrations of 62.5, 125, and 250mg aqueous garlic extract per kg live weight per day for 42 days. The groups fed with the highest concentration gained significantly more body weight. Hb, PCV, RBC, lymphocytes, and WBC levels were also greater in kids given garlic extract supplementation. Burke et al., (2009) discovered inconclusive outcomes after giving garlic to gastrointestinal nematode-infected kids and lambs. While Zhong and colleagues in 2019 discovered clear results, he discovered that lambs infected with gastrointestinal lambs had lower faecal egg count and enhanced packed cell volume and body condition scores.

Azolla

Azolla contains 25-35% protein, 10-15% minerals, 7-10% aa, bio-active substances & bio-polymers , low in fats & carbohydrates (Pillaiet al.,2005).It can be readily collected with a scoop net, or it may be cultivated in enclosed, floating rings that can be pushed to the edge for simple harvesting. The use of azolla in goat feed not only enhances the health and survival of kids, but it also reduces the cost of feeding, as reviewed here.

Ghodakeet al., 2012 investigated the effect of different levels of Azolla meal on the growth performance of Osmanabadi kids and discovered that inclusion of 15% in total concentrate increased the live weight gain of kids and lowered the total cost of lower weight gain per kg. Hence, the inclusion of azolla in creep feed of kids and lambs not only improves the health status of kids but also economizes the cost of feeding (Toradmalet al., 2017; Agareet al., 2015).

It was found from the different studied the efficacy of shatavari (Asparagus) by giving it to dogs and their kids in order to increase their growth rate, disease prevention, and, ultimately, their general health condition. The current review attempted to substantiate the usage of shatavari (Asparagus racemosus) for improving kids' health and lowering mortality, as well as for reducing goat farming costs (El-Fadel et al., 2020).

Shatavari is a medicinal plant that is used to cure a variety of major disorders affecting tissues such as the eyes, muscles, and reproductive systems, as well as to increase milk secretion and aid in regaining vitality, making it a potent anabolic (Bhokardankar et al., 2019). It is important to use herbal galactogogue (Gupta and Shaw, 2011; Behera et al., 2013) for safe milk production and neonatal kid growth in order to boost immunity and, eventually, reduce kid mortality. On the basis of researchers it was found that prepartum feeding of shatavari to crossbred at 125 mg/kg and 250 mg/kg body weight per day significantly raised litter weight at birth, child's growth rates and weaning weights, and reduced child mortality (Mirzaeiet al., 2011).

Conclusion

Inclusion of unconventional feedstuffs like moringa, garlic, azolla and shatavari in the feeds of kids not only increases their performance but also reduces the cost of feeding in goat farming. They are sources of protein and energy. They are available throughout the year, so the stress of farmers producing feed will be alleviated. Hence, it is easy solutions to feed scarcity.All are excellent sources of good quality protein and energy. Their protein content makes the feed more palatable and increases the nitrogen availability to the rumen.

Conflicts of interest

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

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