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MILK AND MILK REPLACER PERFORMANCE IN DAIRY CALVES

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ABSTRACT

As the future productive units of a dairy herd, calf feeding is important that represent to grow economically and at optimal rate to achieve puberty at lesser age. The first two month are important in rearing calves for replacement heifers that allows a smooth transition from milk to solid feed. In past, different scientist struggles to develop an appropriate feeding method that is more efficient, reduce disease risk and cost effective. To encourage early intake of milk, milk replacer, calf starter and conventional feeding program have a limitation to supply of milk @ 10% of body weight, have many pros and cons. However, calves fed free access of milk critically reviewed the literature and examining that feeding whole milk, milk replacer, and starter ration are needed to exploit more through research. The milk feeding calves should be fed in such a way to have greater body weight, improve feed efficiency, reduced incidence of disease, and have a natural behaviour, weaning methods influences feed efficiency, rumen development, improve growth and have a long term effect on heifer performance and improve lactation performance in dairy cattle.

Keywords: Milk, Milk Replacer, Starter Ration, Feeding Management, Nutrition

INTRODUCTION

The rumen development in young calves depends upon the age and quality of feed that is provided from liquid and solid feed (Weary *et al.,* 2009). The scientist have focused on emergent feeding strategies that facilitate early weaning and transitioning from liquid to solid feed (Baldwin *et al.,* 2004). The effort is mostly on improving the supply of milk or using alternate source of milk like milk replacer. Different research had focused on the supply of milk replacer and reported that feeding milk replacer at early age limited the growth as compared with the calves rear by the cow that increased the calf mortality (Flower and Weary, 2001). One disadvantage of feeding whole milk is increasing the demand of milk by human population that cause diminution supply to young calves that eventually affect the performance of young calves and slower the rumen development. Diaz *et al.* (2001) reported that feeding milk and milk replacer may be counterproductive to early weaning if more milk and milk replacer have been fed to calves (Cowles *et al.,* 2006; Bar-Peled *et al.,* 1997). Weaning and postweaning reduction in Average daily gain have been reported in peer-reviewed trials where large amount of milk and milk replacer were fed to calves (Jesper and Weary, 2002). The reduction in average daily gain is largely associated with less starter intake, poor feed efficiency and large amount on milk or milk replacer intake (Terre *et al.,* 2007). Bascom *et al.,* (2007) reported that unnecessary milk and milk replacer has been repeatedly exposed to generate weaning and postweaning reduction in calf performance. It is recommended that if milk supply is limited in calves management program, replacer can be used to reduce the daily variation of nutrients consumed by the calves.

To our knowledge no attempt has been made to understand the available scientific information on milk and milk replacer fed to calves, and no systematic attempt has been made to understand how milk and milk replacer affect the performance of the calves from artificial rearing of the milk fed calves.

Direct suckling calves: In Pakistan, the cattle like Sahiwal, Red Sindhi and Cholistani etc. are domesticated are allowed to rear their calves by direct suckling where the dam express its different maternal behaviour like liking, grooming, nursing and protect their calves from different environmental hazards (Van keyserlingk *et al.,* 2007). In early reviewed by different scientist (Reinhardt and Reinhardt, 1981; Das *et al.,* 2000; Nolte *et al.,* 1981) reported that the daily direct suckling time and frequency reduced with the calf age and ultimately stop at the 6 months of age. The suckled calves start grazing and forage age intake and ruminating at 3 weeks of age and their rumen is completely developed at 4 to 6 month of age (Mirza and Provenza, 1994). In small holder and extensive village production system of raising cattle and buffalo most of the animals are reared by direct suckling and many scientists reported more weight gain, better feed efficiency and good calves-dam behaviour. The weaning is often imposed at younger age which results in distress for calves and dam (Latham and Mason, 2008). In conclusion the indigenous calve reared with dam have a long term better performance and persistence and better for selection as replacement heifer.

Feeding whole milk: The appropriate and ample supply of calves through milk is important for animal performance. During the last several decade several scientist studied the common practice of providing limited amount of milk to get better performance of calves (Hammon *et al.,* 2002; Godden *et al.,* 2005; Khan *et al.,* 2007a). Their studied showed that restricted milk decreased the weight gain, increased the risk of disease and abnormal behaviour in calves whereas the study by Jesper and Weary, (2002) reported that greater quantity of milk improves growth rate and feed efficiency. Drackley, (2008) reviewed that milk feeding accelerated growth, enhanced nutrition and growth in young calves. The research reported by (Boussingault, 1845) claimed that the calves fed about 8 kg of the milk daily gained 0.9kg of body weight per days. Poor growth was due to insufficient supply of nutrients from milk and sudden change can cause scour and reduces the growth rate and ultimately increased the weaning time. Several authors have noted problems with the ability of NRC (2001) standered to predict the protein requirement for milk fed calves and did not agreed with experimental evidence from other nutritional requirement system (Davis and Drackley, 1998).

Feeding milk replacer: The research summarized by (Hill *et al.,* 2007; Hill *et al.,* 2008) demonstrated that milk replacer can support equivalent or greater calf performance if milk replacer is supplemented with amino acid and fatty acid. Similarly the research conducted by Bar-Peled *et al.,* (1997) support the idea of increased rate of milk replacer feeding to increase the rate of gain. Bartlett McKeith, (2006) reported that conventional milk replacer contain 20-22% CP increased lean tissue growth. The study conducted by Strzetelski *et al.,* (2001) was consistent that feeding too much milk replacer will result in post weaning reduction in growth that might be due to less intake of nutrient and delayed rumen development. Jesper and Weary, (2002) reported that dairy calves have been fed milk replacer @ 10% of body weight of calves, the level allows only for maintenance requirement and minimal weight gain under thermo-neutral condition

Feeding milk with starter ration: Khan *et al*. (2008) described that calves consumed starter ration at 14 day of age, the intake of starter ration increases as feeding milk is reduced. Kertz *et al.,* (1979) studied the inverse relationship between milk and solid feed intake. Similar results also reported by Terre *et al.,* (2007). Cowles *et al.,* (2006) reported that if the calves fed milk or milk replacer consume as much starter as fed higher amount of milk before weaning and reduces solid feed among calves. However when unlimited amount of milk are offered to young calves they begin to chew solid feed at 2nd week of life. Diaz *et al.,* (2001) reported that if the calves are not given solid feed in early age they begin to consume bedding material, suggesting a growing hunger for solids as calf's age. After weaning feeding calves are governed by digestive capacity, physio-chemical attribute of solid feed and change in absorption metabolites (Lesmeister and Heinrichs, 2004) It has been known that calves can grow a lot faster when they are supplied with more nutrients (Marshall and Smith, 1970). Large amount of Milk before weaning may delayed rumen development and physio-chemical properties of rumen and cause lower solid feed consumption. Thus restricted milk feeding should be introduced to encourage calves to eat concentrate and minimize cost for relatively expensive liquid milk.

Conclusion: The prose reviewed over showed that in conventional feeding practices the animals cant fulfil their dry matter intake, less nutrients leaves the animals weak, affect on health and future milk production. However, the literature reviewed showed that milk intake reduces the dry matter intake, reduces the feed consumption. Solitary approach on the issue that calves rear with dam plays a major role in controlling disease, dry matter intake and growth performance. The calves feed on milk replacer do not account for maternal influence in milk intake particularly in 1 week of age. The variation in milk intake may arise from the lake of maternal behaviour. The restricted milk intake courage dry matter intake and effects after about 3 weeks of age, younger calves benefits from increased milk express natural feeding behaviour and improve health and benefits replacement heifers.

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