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Study on Calf Care and Management Practices Followed by Dairy Farmer's in Punjab, India

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A B S T R A C T

A purposive study was conducted on 200 cattle farmers selected randomly from all over Punjab. The data was collected by personal interview cum questionnaire schedule consisting of the management practices followed by the farmers and knowledge regarding the calf rearing practices. Data revealed that 60% farmers provided a separate calving pen for parturition but not all of them know the exact measurements. About 1/5th (19.5%) of the respondents did not practiced removing all mucus from the nose and mouth in both male and female calves after birth, 99.5 % of the respondents fed colostrum to the new born female calves, 88 % of the dairy farmers fed colostrum to the male calves, 6% castrated the male calves and 83.3% among these used the castrated calves for sports activities and about just 16.6 % castrated the calves for the sake of good management. Routine vaccination of the female calves was done by 89 % of the dairy farmers, 77.5% of the dairy farmers dewormed the female calves, 98 % of the dairy owners did dehorning of the female calves, 27.5 % of the dairy owners did female calf identification in the herd. Study concluded that female calves has edges in getting the attention of farmers in terms of new born calf care, disease management, feeding, housing and record keeping as compared to male calves.

Introduction

Livestock play a vital role in the agricultural and rural economies of the developing world. Besides producing food directly, they also provide key inputs to crop agriculture. Calf management is an important aspect of cattle husbandry but it is most often neglected due to ignorance of farmers. An efficient calf rearing ensures cattle with better growth, health and productivity. Thus scientific calf rearing is not only crucial in determining the future income and sustainability of dairy enterprise but also important in preserving and maintaining of germplasm. Calves need to receive individual attention and care from the very beginning that is in womb to the time of birth farmer, which means right after birth as a new born calf is almost unprotected against the diseases (Maousami *et al.*, 2013). The objective of this study was to determine the practice viz cleaning of new born, colostrum feeding,

housing, disease prevention, vaccination etc, being followed by cattle owners in rearing male and female calves.

Materials and Methods

The data was collected randomly from 200 dairy farmers all over Punjab. The response of the farmers on the enlisted calf rearing practices relating to feeding, management, new born calf care and health care of both male and female calves was obtained with the help of a structured questionnaire cum interview schedule. The collected data were carefully examined for its completeness and correctness before tabulation. For analysis, simple tabular techniques and standard appropriate statistical methods and tools like SPSS 20.0 and Microsoft Offices Excel were employed to generate inference.

Results and Discussion

Provision of calving pen

It was observed that out of a total of 200 dairy farmers majority, 120 (60 %) provided a separate calving pen for parturition while 80 (40 %) did not had a separate calving pens at their farms (Table 1). Out of the 120 respondents who provided a separate calving pen for pregnant cows but not all of them know the exact measurement and some of them only separate the animal to a different place were parturition took place but not a proper calving pen was built and among these farmers only 64 (53.33 %) dairy farmers separated the pregnant animal 7 days before parturition, 33 (27.5 %) dairy farmers separated the pregnant animals 7 – 15 days before parturition while 23 (19.16 %) respondents separated the pregnant animal 15-30 days before parturition. It was observed that out of 200 respondents, 116 (96.6 %) of the dairy farmers disinfected the calving pens while 4 (3.4 %) of the dairy farmers did not disinfected the calving pens before parturition. Almost all the respondents provided the necessary means to keep the calves warm during the winter season. It was further seen that 19.5 % of the respondents did not practice removing all mucus from the nose and mouth of the female calf after birth while majority, 80.5 % of the respondents removed the mucus from the nose and mouth of the female calf immediately after birth. 22 % of the respondents did not remove mucus from the mouth and nostrils of male calf while 78 % of the respondents removed mucus properly in male calves.

In female calves 9 % respondents did not practice holding the new born female calves by rear legs in order to facilitate the removal of pulmonary secretions while 91 % of the respondents practiced the same in new born male calves. It was further observed that 16.5 % of the dairy farmers did not removed the pulmonary secretions from new born male calves by holding from the rear legs while 84.5 % of the dairy farmers followed the practice of removing pulmonary secretions of new born male calves by holding them from rear legs. 98% of the dairy owners made some preparation before the parturition of the pregnant anima and 57.5% dairy owners incised the naval cord of the new born calf after birth. Among the 200 respondents, 74% did not practice dipping the naval cord of the new born calf with iodine solution. 84.5% of the dairy owners keep the calving place dry and clean during the first 12 hours after the birth. Mee (2008) highlighted few critical tasks that are to be taken care of immediately after the birth of calf. First, assess the vital signs of the calf to ensure it is alive. Check its breathing followed by heart rate and movement. Second, in order to get the calf's air passageway cleared and flowing through the nasal receptors use straw or a finger. Then, suspend the calf upside down for a few seconds to stimulate postural drainage of

pulmonary fluids. It also helps with the stimulation of pulmonary gas exchange and acid-base balance to prepare the rumen for immunoglobulin absorption.

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Feeding of colostrum

It was observed that 99.5% of the respondents fed colostrum to the new born female calves while only 0.5% of the dairy farmers did not followed the practice of feeding colostrum to new born female calves. 88% of the dairy farmers fed colostrum to the male calves while 12% of the dairy farmers did not fed colostrum to the new born male calves (Table 2). It was observed that 76.8% of the dairy farmers fed colostrum twice and 23.6% respondents fed colostrum thrice to the new born female calves. It was observed that 4.5% of the respondents fed colostrum once, 89.2% fed twice while 6.25% respondents fed the colostrum thrice to the new born male calves. Okomoto *et al.,* (1986) reported that feeding of colostrum had no significant effect on resting or summit metabolism was positively related to body weight and large calves were slower to become hypothermic than small calves. Ahmad *et al.,* (2009) reported in a study that none of the farmers was cutting and disinfecting the navel cord and a large number of them fed colostrum after the expulsion of placenta.

In the present study it was found that 0.5% of the dairy farmers did not fed colostrum to the new born female calf immediately after birth. 61.5% of the dairy farmers fed colostrum within two hours after birth, 29% of the dairy farmers fed colostrum within 2 to 6 hours after birth while about 5% of the respondents fed colostrum 12 hours after birth and 4% of the respondents gave colostrum after 12 hours of birth to the new born female calf. It was observed that during the birth of male calves 12% of the respondents did not followed the practice of feeding colostrum within a few hours after birth while 30.5% of the respondents fed colostrum 2 hours after the birth of new born male calf. Further it was observed that 34% of the farmers fed colostrum within 2 to 6 hours after birth, 19% of the respondents gave colostrum 6 to 12 hours after birth and 4.5% of the farmers fed colostrum 12 hours after the birth of male calf. Of all the respondents 36.7% checked the quality of colostrum while 63.3% did not checked the colostrum quality. And among the 36.7% farmers it was observed that 17.56% of the dairy farmers checked the quality of colostrum by visual inspection, 4.05% by tasting the colostrum milk and majority 78.37% of the dairy farmers used both the methods of visual and taste for checking the quality of colostrum. Of all the dairy farmers, 62.5% stored the colostrum milk for further use of for their own and calf or while 37.5% did not stored it. Among 62.5% respondents 98% of the respondents stored the colostrum in refrigerator while the other 12% kept the colostrum in freezer. The process of thawing of colostrum was followed by all the respondents. It was observed that 37.6% of the respondents did thawing by the traditional stove and 62.4% of them used gas stove for thawing of colostrum.

It was observed that 4.5% of the dairy farmers used bucket/bowl for feeding the colostrum to female calves, 17.08% used bottle, while majority 78.3% allowed the female calves to suckle the dam's teats. In the case of new born

male calves, 28.4% of the dairy farmers used bucket/bowl for feeding the colostrum, 15.9% used bottle and 55.6% of them allowed suckling of the dam's teats. Mengesha (2013) reported that Colostrum contains a high level of immunoglobulin's and other nutrients important for lamb health and gives immunity against a variety of infectious agents. The poor immune system and lack of previous exposure to infection make new born calves susceptible to infectious diseases and poor management.

Among all the respondents 47.15% said that they did not discriminate between the male and female calf while feeding the colostrum and 52.8% of the dairy farmers agreed to the fact that they did not provide equal proportion of the colostrum to male and female calves. Regarding the importance of colostrum feeding, 86.5% of the dairy farmers knew the fact that colostrum contain ingredients that helped to make antibodies necessary for the resistance against diseases while 13.5 % of the dairy farmers were not aware of the composition as well as the importance of colostrum feeding to calves.

Castration

It was observed that out of 200 respondents, only a small proportion comprising of about 6 percent castrated the male calves and 83.3% among these used the castrated calves for sports activities and about just 16.6% castrated the calves for the sake of good management (Table 3). Around 94% of the dairy farmers did not castrate the male calves at all. It was observed that 50% castrated the male calves at the age of less than one month and 2 to 3 months. Surgical castration was followed by none of the respondents while 100% of the farmers preferred Burdizzo's castrator for performing castration on calves. Tarrant (1981) reported that benefits of castration include a reduction in aggression and mounting behaviour of males causing fewer injuries in confinement operations and reduced dark-cutting beef. Lents *et al* (2001) reported that in most production settings, physical castration methods are the most common. These can be subdivided into procedures involving surgical removal of the testes, or methods that irreparably damage the testicles by interruption of the blood supply using a castration clamp (Burdizzo castration), rubber ring or latex band.

Vaccination

Routine vaccination of the female calves was done by 89% of the dairy farmers while 11% of the respondents did not performed routine vaccination in female calves. 69% of the respondents' vaccinated male calves while 31% of the respondents did not vaccinated the male calves (Table 4). It was observed that out of 178 respondents who vaccinated female calves 85.95% of the respondents vaccinated the female calves for FMD, H.S and B.Q while 14.04% of the respondents vaccinated the female calves for all major diseases including FMD, H.S, B.Q, Brucellosis and theleriosis. All the dairy farmers vaccinated the male calves for all the diseases. In the current study, 84.8% of the respondents vaccinated the calves for FMD at the age of 4 to 6 months while 15.16% of the respondents vaccinated the calves at the age of 6 to 8 months. For H.S, 29.77% of the dairy farmers vaccinated the calves at the age of 4 to 6 months, 55.61% of the respondents' vaccinated calves at the age of 6 to 8 months while 14.6% of the respondents vaccinated the calves at the age of more than 8 months. For B.Q, 29.77% of the dairy farmers vaccinated the calves at the age of 4 to 6 months, 55.61% of the respondents' vaccinated calves at the age of 6 to 8 months while 14.6% of the respondents vaccinated the calves at the age of more than 8 months and 14.04% dairy farmers did vaccination for brucellosis. 5% farmers vaccinated the female calves at the age of 8 to

10 months while 9.5% farmers vaccinated the female calves at the age of more than 10 months and majority 85.9% of the dairy farmers did not vaccinated the female calves at all. It was seen that 80.33% of respondents gave booster vaccination to female calves while only 19.7% did not gave booster vaccine in female calves. Booster vaccination in the case of male calves was given by only 20.3% of the farmers while majority 79.7% did not gave booster vaccine to male calves. Windeyer *et al.*, (2012) showed that vaccinating pre-weaned calves for Bovine Respiratory Disease (BRD) did not reduce the number of incidence of illnesses implying that vaccinations are unnecessary for a young calf. The complexity of the many components of a young calf's immune system inhibits the ability for an immune response to vaccinations. Vaccinating three quarters of the herd reduced the transmission of viral diseases approximately 48%. This reduces the pathogen load throughout the herd resulting in lower cases of infection in the future.

Deworming

It was observed that out of 200 dairy farmers, majority 77.5% of the dairy farmers dewormed the female calves while 22.5% did not deworm the female calves. Similarly it was found that 43.5% of the farmers dewormed the male calves while 56.5% did not vaccinate the male calves (Table 5). Hence it can be inferred that deworming was performed by majority of the farmers in female cattle calves than the male calves. In the female calves, 54.19% of the respondents dewormed at the age of 1 to 2 months, 41.29% dewormed at the age of 2 to 3 months while 4.5% dewormed at the age of 4 to 6 months. Maousami *et al.*, (2013) conducted a study to ascertain the calf management practices followed by the owners. Majority of the farmers were not following deworming of pregnant dam in last trimester and were not calling veterinarians at the time of calving. Sharma and Mishra (1987) reported that Deworming in calves is essential and regular deworming cycle should be followed against parasitic infections. This practice should be started on or before two weeks of age, followed after 21 days and should be repeated 3-4 times in a year at regular interval. A major reason of calf mortality is the parasitic load in the calves due to which their health deteriorates and the calf often dies. In the case of male calves at the age of 1 to 2 months 14.9% dewormed the male calves, at the age of 2 to 3 months 56.3% of the dairy farmers dewormed the calves, at the age of 4 to 6 months 25.2% of the farmers dewormed the calves and at the age of 6 months 3.4% of the dairy farmers dewormed the male calves. It was further observed that 77.4% of the dairy farmers regularly dewormed the female calves while 22.5% did not. Similarly 17% of the respondents dewormed the male calves regularly and the other 83% respondents dewormed the male calves at regular intervals. For deworming the female calves, 76% of the respondents used the traditional or desi method while 24% did not used the traditional method of deworming. In case of male calves, 43.5% dairy farmers used the traditional methods of deworming while 56.5% used some other methods of deworming. 94.5% of the dairy owners removed the extra teats in calves while 5.5% did not remove any extra teats in calves.

Dehorning

It was observed that 98% of the dairy owners did dehorning of the female calves while only 2% of the farmers did not dehorn their female calves. 94.5% of the respondents did dehorning of calves for a specific reason while 5.5% of the owners did not gave a valid reason behind dehorning of calves (Table 6).

Table.1 Management of pregnant animal

Sr. no	Particulars	Response	Freq.	%age
1	Do you provide separate calving pen for parturition?	Yes	120	60
		No	80	40
2	How many days before parturition do you separate the pregnant cattle to a calving pen? (n=120)	7 days before	64	53.33
		7-15 days before	33	27.5
		15-30 days before	23	19.16
3	Do you disinfect the calving pen before parturition? (n=120)	Yes	116	96.6
		No	4	3.4
4	Do you provide any mean to keep the calves warm during the winter season?	Yes	200	100
		No		
5	Do you remove all the mucus from the nose and mouth of the calf after birth? (Female calf)	Yes	161	80.5
		No	39	19.5
6	Do you remove all the mucus from the nose and mouth of the calf after birth? (Male calf)	Yes	156	78
		No	44	22
7	Do you practice holding the rear legs in order to facilitate the removal of pulmonary secretion? (Female calf)	Yes	182	91
		No	18	9
8	Do you practice holding the rear legs in order to facilitate the removal of pulmonary secretion? (Male calf)	Yes	169	84.5
		No	31	16.5
9	Do you made some preparations before the parturition?	Yes	196	98
		No	4	2
10	Cutting of naval cord after birth	Yes	115	57.5
		No	85	42.5
11	Do you practice dipping of the naval cord with iodine solution after cutting?	Yes	148	74
		No	52	26
12	Provision of dry and clean place to calf after birth	Yes	169	84.5
		No	31	15.5
13	Do you made some preparation before parturition	Yes	196	98
		No	4	2
14	Cutting of naval cord after birth	Yes	115	57.5
		No	85	42.5
15	Do you practice dipping the naval cord with iodine solution	Yes	148	74
		No	52	26
16	Dry and clean place for calves during first 12 hours after birth	Yes	169	84.5
		No	31	15.5

Table.2 Colostrum feeding, storage, thawing

Sr.no	Particulars	Response	Freq.	%age
1	Feeding of colostrum to new born calves? (Female)	Yes	199	99.5
		No	1	0.5
2	Feeding of colostrum to new born calves? (male)	Yes	176	88
		No	24	12
3	How many times you feed colostrum?(Female) (n=199)	Once	0	0
		Twice	152	76.4
		Thrice	47	23.6
4	How many times you feed colostrum?(male) (n=176)	Once	8	4.54
		Twice	157	89.2
		Thrice	47	6.25
5	Time of feeding of colostrum for first time**?**	Do not feed	1	0.5
		Within 2hour after birth	123	61.5
		Within 2-6 hour after birth	58	29
		Within 6-12 hour after birth	10	5
		After 12 hour after birth	8	4
6	Time of feeding of colostrum for first time**?**	Do not feed	24	12
		Within 2hour after birth	61	30.5
		Within 2-6 hour after birth	68	34
		Within 6-12 hour after birth	38	19
		After 12 hour after birth	9	4.5
7	Checking of colostrum quality?	Yes	74	37
		No	126	63
8	Method of checking the colostrum quality? (n=74)	Visual inspection	13	17.56
		Taste	3	4.05
		Visual & taste both	58	78.37
9	Storage of colostrum?	Yes	125	62.5
		No	75	37.5
10	How storage of colostrum is done? (n=125)	Refrigerator	110	88
		Freezer	15	12
		Store without refrigerator	0	0
11	Thawing is done	Yes	125	62.5
		No	75	37.5
12	Method of thawing (n=125)	Traditional stove	47	37.6
		Gas stove	78	62.4
13	Method of colostrum feeding? (female) (n=199)	Bucket or bowl	9	4.5
		Bottle	34	17.08
		Dam	156	78.39
14	Method of colostrum feeding? (male) (n=176)	Bucket or bowl	50	28.4
		Bottle	28	15.9
		Dam	98	55.6
15	Feeding equal amount of colostrum to male and female calves?	Yes	93	52.8
		No	83	47.15
16	Do you know the composition of colostrum	Yes	173	86.5
		No	27	13.5

Table.3 Castration management of calf

Sr. no	Particulars	Response	Freq.	%age
1	Castration	Yes	12	6
		No	188	94
2	Purpose of castration (n=12)	Sports	10	83.4
		Better management	2	16.6
3	Age of castration (n=12)	Less than 1 month of age	6	50
		2-3 months of age	6	50
4	Method of castration (n=12)	Burdizzo castrator	12	100
		Surgically	0	

Table.4 Vaccination of calves

Sr. no	Particulars	Response	Freq.	%age
1	Vaccination done (female calves)	Yes	178	89
		No	22	11
2	Vaccination done (male calves)	Yes	138	69
		No	62	31
3	Vaccination done for FMD, H.S&B.Q in female calves (n=178)	Yes	178	100
		No	0	-
4	Vaccination done for brucellosis &theleriosis (n=178)	Yes	25	14.04
		No	153	85.95
5	Age of vaccination for FMD (female calves) (n=178)	4 to 6 months	151	84.8
		6 to 8 months	27	15.2
6	Age of vaccination for H.S &B.Q (female calves) (n=178)	4 to 6 months	53	29.77
		6 to 8 months	99	55.61
		More than 8 months	26	14.6
7	Age of vaccination for brucellosis (female calves) (n=178)	6 to 10 months	8	4.49
		More than 10 months	17	9.55
		No vaccination	153	85.95
8	Booster vaccination (female calf) (n=178)	Yes	143	80.3
		No	35	19.7
9	Booster vaccination (male calf) (n=138)	Yes	28	20.3
		No	110	79.7

Table.5 Deworming and extra teats removal practices

Sr. no	Particulars	Response	Freq.	%age
1	Deworm (Female calves)	Yes	155	77.5
		No	45	22.5
2	Deworm (male calves)	Yes	87	43.5
		No	113	56.5
3	Age of deworming (female calves) (n=155)	1 to 2 month	84	54.19
		2 to 3 month	64	41.29
		4 to 6 month	7	4.5
		More than 6 month of age	0	0
4	Age of deworming (male calves) (n=87)	1 to 2 month	13	14.9
		2 to 3 month	49	56.3
		4 to 6 month	22	25.2
		More than 6 month of age	3	3.4
5	Regular deworming (female calves) (n=155)	Yes	120	77.5
		No	35	22.5
6	Regular deworming (male calves) (n=87)	Yes	14	16.1
		No	73	83.9
7	Local/traditional method of deworming (female)	Yes	152	76
		No	48	24
8	Local/traditional method of deworming (male)	Yes	87	43.5
		No	113	56.5
9	Removal of extra teats	Yes	189	94.5
		No	11	5.5

Table.6 Dehorning practices

Sr. no	Particulars	Response	Freq.	%age
1	Dehorning	Yes	189	94.5
		No	11	5.5
2	Method of dehorning (n=189)	Chemical	55	29.1
		Mechanical	134	70.9
3	Age of dehorning (n=189)	1 to 2 month	105	55.5
		More than 2 months	84	44.4
4	Call veterinarian for dehorning (n=189)	Yes	162	85.7
		No	27	14.3

Table.7 Calf identification

Sr. no	Particulars	Response	Freq.	%age
1	Calf identification (female)	Yes	55	27.5
		No	145	72.5
2	Calf identification (male)	Yes	1	0.5
		No	199	99.5
3	Purpose of identification (female) (n=55)	For insurance	40	72.7
		Theft prevention, animal identification, isolation of animals in diseased condition	15	27.27
4	Purpose of identification (male) (n=1)	For insurance	1	100
		Theft prevention, animal identification, isolation of animals in diseased condition	0	
5	Method of identification (female) (n=55)	Ear tagging	55	100
6	Method of identification (male) (n=1)	Ear tagging	1	100
7	Purpose of rearing male calves (n=200)	selling	139	69.5
		Abandon	44	22
		rearing	17	8.5
8	Age of selling male calves (n=139)	2 to 3 months	44	31.6
		4 to 6 months	55	39.56
		More than 6 months of age	40	28.77
9	Purpose of rearing male calves (n=17)	Breeding	1	5.88
		Sports	12	70.6
		Both breeding and sports	1	5.88
		Draught	3	17.6
10	Consultation with veterinarian for health management (female)	Yes	171	85.5
		No	29	14.5
11	Consultation with veterinarian for health management (male)	Yes	53	26.5
		No	147	73.5

Ballou *et al.*, (2013) reported that dehorning with hot iron provokes not only suppressive effect on leucocyte response, but is also connected to acute phase response via an increase in blood haptoglobin level. Chemical method of dehorning was carried out by 29.1% of the dairy farmers while the other 70.9% used mechanical method of dehorning in both male and female calves. 55.5% of the respondents did dehorning at the age of 1 to 2 months while 44.4% of the owner did dehorning of calves at the age of above 2 months. Faulkner and Weary (2000) reported that in numerous countries, inter alia in the United States, dehorning is performed without an anaesthesia application. Gottardo *et al.*, (2011) that dehorning was carried out on 80% of the surveyed farms, and disbudding was the method reported by all the interviewed farmers. Hot-iron cauterization was the preferred method for disbudding (91%). On average, disbudding was performed at 32 days of age and it was more likely in farms with ≥60 cows than in smaller dairy holdings. The assistance of veterinary doctor for dehorning the calves was taken by 85.7% of the dairy farmers while the other 14.3% dairy owners did not call veterinarian for dehorning the calves. Doherty *et al*, (2007) and Ballou *et al*, (2013) reported that dehorning is also related to a distinct effect on the immune system. This procedure leads to leucocytosis and neutrophilia. Heinrich *et al*, (2010) reported that the calves may experience the pain even up to 27 hours after dehorning. An application of NSAID did not affect significantly the play behaviour of calves (up to 27 hours) and there was no difference between the treatments in head-related locomotors behaviours at either 3 or 27 hours post disbudding.

Identification

It was found that 27.5% of the dairy owners did female calf identification in the herd while 72.5% of the dairy owners did not use any method for identifying the female calves. Out of the 200 respondents, only 0.5% dairy owners practiced identification of male calves while majority 99.5% did not followed any identification techniques in male calves (Table 7). It was further seen that 27.7% of the owners did female calf identification in order to prevent theft, insurance purpose, isolation of diseased calves, animal identification while majority of 72.7% owners did identification solely for the insurance purpose. Moreki *et al*, (2012) reported that four methods of cattle identification exist in Botswana and these are ear notching, hot iron branding, conventional ear tags (usually plastic ones) and rumen bolus.

It was seen that among the 200 dairy owners, 69.5% of the farmers reared male calves for the purpose of selling, 22% farmers simply abandoned the male calves and only 8.5% farmers reared male calves on the farm. Among the 139 respondents who sold the calves, 31.6% of them sold them at the age of 2 to 3 months, 39.5% sold at the age of 4 to 6 months while 28.7% of the farmers sold calves at the age of more than 6 months. Among the 200 respondents, 85.5% of the respondents discussed the health management system of female calves with the veterinarian while the other small proportion of 14.5% did not discussed the health of female calves with the veterinary doctor. In the case of male calves, health management system was discussed by only 26.5% of the farmers while 73.5% did not discussed the health management system of male calves with the veterinary doctor

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