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Ethno-veterinary Treatment of Livestock and Poultry by Ethnic Community of Dhemaji District, Assam, India

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ABSTRACT

Background: Livestock and poultry are considered as one of the source of income for the rural household which need proper care for their livelihood. To safeguard the livestock and poultry from various health related problems, ethno-veterinary practices, the indigenous healing system is the cheapest and easily available natural resources around them. Traditional animal health care practices are mostly from their experiences or passed on from one to another verbally.

Methods: The present study was carried in randomly selected villages of Dhemaji district. Field study was conducted from September 2020 - April 2021, among the small household local inhabitant of the selected areas who mostly depend on the livestock and poultry farming for socio-economic development, by performing personal interview, semi-structured questionnaire, group discussion and free consultation was conducted with the local peoples.

Result: The study recorded about 36 plant species having medicinal value belonging to 34 genus and 31 families, which are used for treating 22 ailments in livestock. Leaves, stems, fruits, bulb, roots, seeds, rhizomes, bark and peel of plant species are used in treating different ailments of livestock. Leaves (48%) are mostly used in preparing medicine among the other plant parts. Proper documentation of the old practice of ethno-veterinary provides information of the various medicinal plants available around us which are on the verge of extinction due to the negligence by the younger generation and emphasises sustainable use of these resources in our ecosystem. Ethno-Veterinary gives a scope for the pharmaceutical field to discover the bioactive compound present in the plant species for future scientific medical treatment.

Key words: Dhemaji, Ethno-veterinary, Indigenous, Livestock, Medicinal plant, Poultry.

INTRODUCTION

Indigenous knowledge of ethno-veterinary medicine use, for curing different ailments of animal and bird is an old practice since time immemorial. Ethno-veterinary system is based on folklore, beliefs, knowledge wisdom and their skill of handling the medicinal plant species acquired by the local livestock holders. Ethno-veterinary practices are sometimes experimental methods developed by the local herdsmen. Rural dwellers depends on livestock for livelihood, economic security, food and therefore it is an utmost necessity to take help of cheap, easily accessed, safe local resources which are tested for long time on the animals (Ahmad *et al*., 2017). It is used effectively for primary health care treatment of the animals for health and productivity which provide an alternative to expensive drugs available in the market. It is also reported that though classical system of treating ailment is familiar to all over the country yet these system are known to few individual (Pradhan and Mishra, 2018). Ethno-veterinary serves as alternative of conventional medicines for preventing ailments (Rajkumar and Maurya, 2015) and use of medicinal plant in ethno-veterinary is one of the integral part which have broad spectrum and seen to be used in treating many ailments (Nag *et al*., 2007).

Mention may be done of veterinary practices prevailing from the Vedic period where Hindu Vedas, Puranas and ancient books has mentioned the vast treasure of plant species used in the alleviating animal health problems (Rajkumar and Maurya, 2015 ; Rajakumar and Shivanna, 2012).

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India is rich in both floral and faunal diversity and also has a huge wealth of livestock (Raut and Shrestha, 2012). India is one of the world's 12 mega diversity country and account for 8% of global plant resources. It is reported that 35,000 species of plant are known to have healing properties. 75% of world population depends on medicinal plants (SriBalaji and Chakravarthi, 2010). According to a report of WHO, 80% of people in developing countries reckon on traditional knowledge for curing various ailments of both human and animals (Ahmad *et al*., 2017).

Being a developing country, 80% of poor population depends on agriculture. Animal rearing is gaining importance and every rural household is seen to be a part of it (Rajkumar and Maurya, 2015). Livestock has contributed to the development of socio-economic development of rural household and to the industrial sector with its by products.

70% of rural household in India owns livestock are poor landless household who prefer animal rearing due to low initial investment. On the other hand livestock provides a variety of food (meat, milk, eggs *etc.*) and non food products (wool, fur, fibres, skins, organic manures *etc*) and contributes nearly 25% to the gross value of agricultural output. Import and export of livestock has also got important share on economic upliftment of the country (Ali, 2007). Not only plants have got medicinal property, but also animal equally have medicinal properties, however animal research have been neglected in comparison to medicinal plant research (Confessor *et al*., 2009). It is indispensable to identify and document the medicinal plant used by the farmers with the aim on maintaining the cultural practice.

MATERIALS AND METHODS

Dhemaji district is one of the remote rural district of the state which is situated on the north bank of river Brahmaputra. Geographically situated between 94°12′18″ E and 95°41′32″ E longitude and 27°05′27″ N and 27°57′16″N latitude and covers a distance of 3237 sq.km. Many ethnic groups of people inhabit the district- Ahoms, Kalitas, Tiwa, Boro, Misings, Kacharis, Hajong, Deoris *etc.* All are knowledgeable about the use of traditional herbal medicines to treat their livestock health related ailments. Agriculture is the main economy of the people but side by side animal rearing is also one of the occupations of the district and plays a vital role in socio-economic development of the rural areas. Frequent flood related problems stand as a barrier to the economic development of the district.

A field survey was conducted randomly in ten villages (Sripani ahom gaon, Morol gaon, khalihamari gaon, kashoiting gaon, khajua, Ramyapur, Amguri, Jiadhol, Naharani gaon, Naruathan) of Dhemaji district by using the participatory rural appraisal (PRA) method which involve semi-structured interviews, group discussion and free conversation with the local animal and poultry rearers for gathering ethno-veterinary knowledge (kim and Song, 2011) from September 2020-April 2021. During the interview period well knowledgeable people were chosen and photographs of the animal diseases and plant species were shown to them so that no confusion remains. Mostly the elders were observed to have the knowledge of the traditional knowledge irrespective of the gender. Simple questions were asked regarding the animal they rear, health related problems of the animals, healing practice with the help of plant species, mode of preparation of the medicinal doses. Information about the part of the plant used as medicine, vernacular name of the species and seasonal availability of the particular species were recorded. They have also informed the traditional healing practice was acquired either by seeing or verbally from their forefathers or learned by experiments. They mostly prefer home remedies rather than going to the veterinary hospitals because of the distance related issues. Most of the village people have the same knowledge of ethno-veterinary as the remedies keep on circulating between them.

Plants name were checked with http://www.theplantlist.org. Present study is an attempt to document the medicinally important plant used to treat animal health related problems. Plant specimen were identified by using standard literature and floral book of Jain (1991).

RESULTS AND DISCUSSION

In the present study a total of 36 plant species were identified for the treatment of 22 common ailments of livestock belonging to 34 genus and 31 families. Common ailments in livestock and poultry includes fever, dysentery, bloating, diarrhoea, galactogogue, anthrax, urine problem. Fig 1 shows that the 3 plant species found in the study belongs to Solanaceae, 2 belongs to Lamiaceae, Rutaceae, Clusiaceae and Poaceae. According to the Fig 2 the use of leaves (48%) is mostly found in the treatment of animals and poultry health problems, followed by fruits of the plant species (21%), seeds (9%) rhizomes (6%), bulb, roots, stem (4%), barks and peel (2%) respectively.

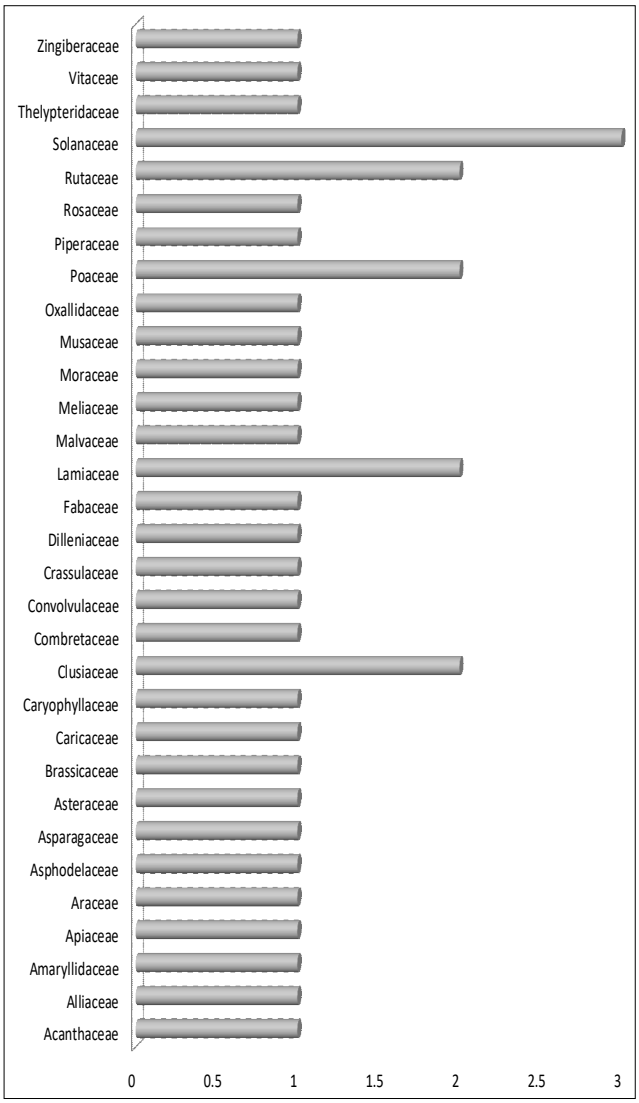

Fig 1: Number of plant species under respective family.

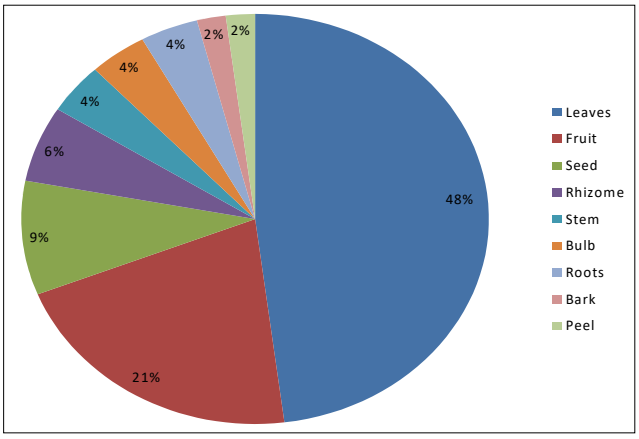

Fig 2: Percentage of plants part used in Ethno-veterinary practices.

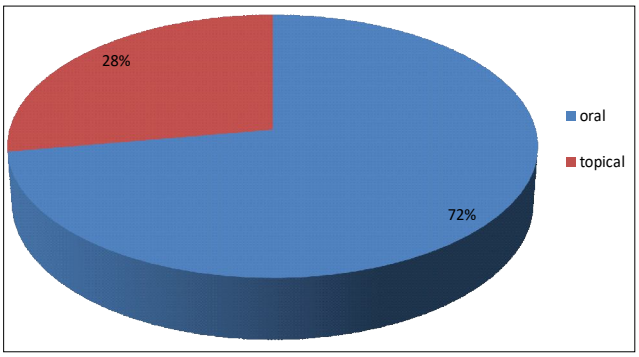

Fig 3: Percentage of mode of use

Table 1 shows the health problems of the livestock, local and scientific name of the medicinal plants used for the treatment, parts of the plant used ,family to which a plant species belongs and mode of preparation of the medicines to be administered. Oral administration (72%) of the medicines prepared traditionally to treat various health issues of the animal and poultry is higher than topical administration (28%) (Fig 3).

Medicinal remedies are used solely or sometimes combine with other species to prepare the medicinal doses (Reddy *et al*., 2006). In the present study, the herbal medicines are seen to be prepared by combining more than one plant species. Seeds of *Brassica juncea* crushed along with *Curcuma longa* powder and *Zingiber officinale* paste and the juice is given orally to treat fever in cow and goat. An equal amount of leaves of *Leucas aspera*, tulsi, pepper, black cumin is crushed and fed orally for ruminal tympany in cow and goat. Bark of the *Terminalia arujuna* tree is crushed and a fine paste *Allium sativum* is prepared for treating bone fracture in cow and goat. Ripe *Piper betel* leaves and few seed of *Cuminum cyminum* is crushed together and fed to treat dysentery in cow and goat. Leaves of *centella asiatica* are crushed with piper *nigrum* and given to eat to cure fever in pig but in case of hen and duck only the leaves are crushed and given to eat. Leaves of *Ipomoea aquatic* is mixed with *Amaranthus spinosus*, ginger, seasame and fed to treat galactogogue in cow, goat and buffalo also the seed of the same plant species is used in treating anthrax in pig, cow, goat, buffaloes.

During the survey, observations are made of the use of one plant species for treating different ailments. Leaves of *Leucas aspera* is used to treat ruminal tympany in cow and goat as well treating diarrhoea in poultry (hen and duck). Fruit of *Citrus aurantifolia* is used for dysentery in hen and pigeon and even cataract in cow, goat, buffalo and pig. Rhizome of *Curcuma longa* is seen to be used for the eye problem in hen and pigeon and even to cure the throat infection in cow, goat, buffalo and pig. *Allium sativum* bulb is seen to be used in ruminal tympany in cow and goat as well as in treating worms on wounds. *Lasia spinosa* rhizome is used to cure dysentery in pig and the stem of the same plant species is used to treat worm problem in pig. The leaves of *Azadirachta indica* are given to cow, goat, pig, buffalo to remove weakness and the juices extracted from the same plant species are applied on the affected area to treat fungus on cow and goat. From the study it is found that the leaves of *Nicotiana tabacum* is used to treat fungus and tick problem in cow and goat.

Traditional healers use the plants parts in the form of paste, decoction, juices and powdered form for the ailments (Raut and Shrestha, 2012). The study documented the use of weaver ant (*Oecophylla smaragdina*) along with the fruit of *Capsicum annuum* for treating fever in Hen and pigeon. Throat infection of cow, goat, buffalo, pig is cured when rhizome of *Curcuma longa* is mixed with honey. The study also document the use of fermented *Oryza sativa* mixed with dried fishes to treat diarrhoea in hen and duck. Therefore use of insects and fish along with the plant species is well observed.

Traditional healing practices by the ethnic community is prevalent in the rural low marginal income animal rearers. Use of leaves, roots, rhizomes, bulb, fruits, seeds, stem, bark of the plant are seen to be used in ethno-veterinary practices and is documented by many authors in their surveys. A survey in Udaipur district has reported 62 plant species for the treatment of 30 diseases in domestic animals (Phondani *et al*., 2010). Another study from western Morang district of Nepal has recorded the use of 37 plant species for 21 ailments. Modes of preparation, application of the medicine and ailments are an essential component in ethno-veterinary. Most frequently used parts are seeds and fruits (Farooq *et al*., 2008). Use of medicinal plants for the same ailments differs from place to place due to difference in knowledge, way of observing the ailments symptoms (Nag *et al*., 2007). A report from the Cholistan desert has documented 77 ethno-veterinary practices comprising 49 plant uses and 25 dairy based products, chemicals (Farooq *et al*., 2008). A total of 18 plant species were documented belonging to 14 families for the treatment of parasitic diseases in the livestock (Githiori *et al*., 2005). Livestock are the main source of livelihood and treasure for the remote dwellers. Besides the use of herbs, shrubs, plant, use of *Hedyotis corymbosa* (Linn.), a weed has got medicinal property in curing animal health problem (Reddy *et al*., 2006).

Table 1: Plant species used in treatments of various ailments.

Affected animal and birds	Ailment	Botanical name of plant species and local names	Family	Parts used	Mode of use
Cow and goat	Fever	*Brassica juncea* (L.) Czern. (Horiyoh)	Brassicaceae	Seed	*Brassica juncea* (L.) Czern. is crushed along with *Curcuma longa* L. and *Zingiber officinale* and the juice is given orally.
	Ruminal tympany	*Leucas aspera* (Wild.) Link. (Dron bon)	Lamiaceae	Leaves	Leaves of *Leucas aspera* (Wild.) Link, tulsi, pepper, black cumin is crushed and fed orally.
		Allium sativum L. (Nohoru)	Amaryllidaceae	Bulb	A decoction is prepared with *Allium sativum* L. and salt and given orally.
	Bone fracture	*Cissus Quadrangularis* L. (Har jura lota)	Vitaceae	Leaves	Leaves paste is tied on the affected area.
		Terminalia arjuna (Roxb.) Wight and Arn. (Arjun gos)	Combretaceae	Bark	Paste of bark of the tree and *Allium sativum* L. is tied on the affected area.
	Wound	*Bryophyllum pinnatum* (Lam.) Oken (Dupor tenga)	Crassulaceae	Leaves	Crushed leaves paste is tied on the wound to stop bleeding.
	Fungus	*Azadirachta indica* A. Juss. (Neem)	Meliaceae	leaves	Juices of leaves are applied on the affected area.
		Nicotiana tabacum L. (Dhopat)	Solanaceae	Leaves	Paste of leaves of *Nicotiana tabacum* L., dried banana peel and mustard oil is applied on the affected area.
	Worms on wound area	*Prunus persica* L. (Ahom bogori)	Rosaceae	leaves	Paste of crushed leaves applied on the affected area.
		Allium sativum L. (Nahoru)	Amaryllidaceae	Bulb	*Allium sativum* L. is crushed and applied.
	Blood dysentery	*Oxalis corniculata* L. (Tengesi)	Oxalidaceae	Leaves	Crushed leaves are fed.
		Dillenia indica L. (O tenga)	Dilleniaceae	Fruit	Fruit is boiled with rock salt and fed.
	Ticks and lice	*Nicotiana tabacum* L. (Dhopat)	Solanaceae	Leaves	Leaves are boiled and poured over body.
	Bloating	*Ficus religiosa* L.(Ahot gos)	Moraceae	Leaves	The mixture of crushed leaves and garlic is given to eat.
	Dysentry	*Piper betle* L. (Pan)	Piperaceae	Leaves	Ripe *Piper betle* L. leaves and few *Cuminum cyminum* L. seed is crushed and fed.
Pig	Fever	*Centella asiatica* (L.) Urban (Bor maninumi)	Apiaceae	Leaves	Leaves are crushed with *piper nigrum* L. and given to eat.
	Dysentery	*Lasia spinosa* (L.) Thwaites (Sengmora)	Araceae	Rhizome	Rhizome is crushed and fed.
		Mikania micrantha kunth (prem lota)	Asteraceae	Leaves	Leaves are crushed and fed.
		Citrus limon L. (kaji nemo)	Rutaceae	Fruit	Juices of the fruit given orally.
	Diarrhoea	*Garcinia morella* (Gaertn.) Desr. (kuji thekera)	Clusiaceae	Fruit	Crushed fruit is given to eat.
	Cough	*Musa balbisiana Colla* (Bhim kaal.)	Musaceae	Peel	Dried peel is burn and made to eat.
	Worm problem	*Lasia spinosa* (L.) Thwaites (sengmora)	Araceae	Stem	Crushed stem is given orally.
Goat	Diarrhoea	*Hibiscus sabdariffa* L. (Tengamora)	Malvaceae	Fruit	Fruit is burn and fed orally.
		Garcinia xanthochymus Hook.f. (Tepor tenga)	Clusiaceae	Fruit	Fruit is burn and given to eat.

Table 1: Continue...

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	Bone fracture	*Eleusine indica* (L.) Gaertn. (Bobosa bon)	Poaceae	Leaves	Crushed leaves are tied on the affected area.
(Poultry) Hen, Duck	Diarrhoea	*Oryza sativa* L. (Chaul)	Poaceae	Seed	Fermented *Oryza sativa* L. is mixed with dried fish and fed.
		Leucas aspera (Wild.) Link (Dron bon)	Lamiaceae	Leaves	Juice of the crushed leaves is mixed with *Citrus limon* (L.) Osbeck juice and given orally.
	Fractured bone	*Eleusine indica* (L.) Gaertn. (Bobosa bon)	Poaceae	Leaves	Paste of the leaves is tied on the affected area.
	Fever	*Mimosa pudica* L. (Nilaji bon)	Fabaceae	Roots	Roots is crushed and made to eat.
		Andrographis paniculata (Burm.f.) Nees (Chirota)	Acanthaceae	Stem Leaves	Leaves and stem are crushed and fed.
		Centella asiatica (L.) Urban (Bormanimuni)	Apiaceae	Leaves	Leaves are made to eat.
	Sluggishness	*Cyclosorus parasiticus* (L.) Farw. (Bihlongoni)	Thelypteridaceae	Leaves	Leaves are laid on the floor and made to rest.
(Poultry) Hen, Pigeon	Fever	*Capsicum annuum* L. (konjolokia)	Solanaceae	Fruit	*Curcuma longa* L. and weaver ant (*Oecophylla smaragdina*) is crushed and given as food.
	Eye problem (conjunctivitis)	*Curcuma longa* L. (Halodhi)	Zingiberaceae	Rhizomes	Powder *Curcuma longa* L. and mustard oil is mixed and applied on the affected area of the eye.
	Dysentery	*Citrus aurantifolia* (Chirstm) Swing (Gul nemu)	Rutaceae	Fruit	Ripe fruit is mixed with rice and given to eat.
Cow, Goat, Buffalo	Galactogogue	*Asparagus racemosus* wild. (Satmul)	Asparagaceae	Roots	Crushed root is fed with milk.
		Ipomoea aquatic Forssk. (Kolmou)	Convolvulaceae	Leaves	*Ipomoea aquatic* is mixed with *Amaranthus spinosus* L., ginger, seasame and fed.
		Carica papaya L. (Amita)	Caricaceae	Fruit	Fruit is made to eat.
Cow, goat, buffalo, pig	Anthrax	*Aloe vera* (L.) burm.f. (salkuwari)	Asphodelaceae	Leaves	Leaves juice is fed.
		Ipomoea aquatic Forssk (kolmou)	Convolvulaceae	Seed	Crushed seed is mixed with water and given to eat.
	Infection of throat	*Curcuma longa* L. (Halodhi)	Zingiberaceae	Rhizome	Rhizome is made into paste and is mixed with honey and lukewarm water and given to eat
	Cataract	*Citrus aurantiifolia* (Christm.) Swingle (Gul nemo)	Rutaceae	Fruit	Juice is put on the corner of the affected eye.
	Bloat	*Drymaria cordata* (L.) Willd.ex. Roem and Schult (Laijabori)	Caryophyllaceae	Leaves	Leaves are crushed and fed.
	Urine problem	*Solanum melongena* L. (Begena)	Solanaceae	Leaves	Leaves are fed.
	Weakness	*Azadirachta indica* A. Juss. (Neem)	Meliaceae	Leaves	Leaves are fed.
		Ocimum sanctum L. (Tulsi)	Lamiaceae	seeds	Seeds are fed.
		Musa balbisiana colla (Bhim kaal)	Musaceae	Fruit	Fruit is made to eat daily.

Traditional healing practices is well documented with the use of 74 plant species for the treatment of rheumatism, fever, bloat, mouth disease, constipation, expulsion of placenta after birth *etc* by the local communities of the Porbandar district ,who are well knowledgeable in handling the medicinal plant (Jadeja *et al*., 2006). A study conducted in Zimbabwe has documented use of 12 medicinal plant for major poultry health problem in respiration, external body parasite etc. (Masimba *et al*., 2011)

An use of 34 species of angiosperm belonging to 30 genera for treating various health related problem by the villagers of Puthalam, Cape Comorin of Tamil Nadu state (Kiruba *et al*., 2006). Traditional knowledge of ethno-veterinary use is depended on availability of certain plant species in the particular season, favourable climatic condition of the area. Traditional healers classify the diseases on observing the signs and symptoms and accordingly treatment is provided. Ethno-veterinary practices are also reported in deworming preparation (Jadeja *et al*., 2006). The plant extracts are constituent of anti-microbial property which helps in improving the animal disease resisting capacity (Rajakumar and Shivanna, 2012). The present study emphasises on the identification of the plant based medicinal treatments used in curing the health related problems of livestock and will help in further phytochemical study on crude drugs.

CONCLUSION

Ethno-veterinary practice is unique from villages to villages which are passed on orally from one individual to another and remain confined to them. Treating animal health related problem with traditional knowledge is due to inhibition of rural people in remote areas and their difficulties in reaching far-flung veterinary centres, making them unable to avail the modern medicinal treatment. This study would keep the rich knowledge of treating ailments with the help of plants alive and further open a way for recognising the proper medicinal plant. It will also prevent destruction of the plant species due to anthropogenic activities and identify the traditional healers who treasure the use of ethno -veterinary practices among themselves. The present study also gives an opportunity for scientific studies on the chemical compound present in the medicinal plant and even may give a chance for alternative pharmaceutical drug production.

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