

# WELCOME

## Breeds Selection and Cross Breeding

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# **Breeds of Cattle and Buffalo in India**

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# Gir



# Indigenous dairy breeds of cattle

## Gir

This breed is otherwise called as Bhadawari, Desan, Gujarati, Kathiawari, Sorthi, and Surati.

- Originated in Gir forests of South Kathiawar in Gujarat also found in Maharashtra and adjacent Rajasthan.
- Basic colours of skin are white with dark red or chocolate-brown patches or sometimes black or purely red.
- Horns are peculiarly curved, giving a 'half moon' appearance.
- Milk yield ranges from 1200-1800 kgs per lactation.
- This breed is known for its hardiness and disease resistance

# Red Sindhi



# Red Sindhi

- This breed is otherwise called as Red Karachi and Sindhi and Mahi.
- Originated in Karachi and Hyderabad (Pakistan) regions of undivided India and also reared in certain organized farms in our country.
- Colour is red with shades varying from dark red to light, strips of white.
- Milk yield ranges from 1250 to 1800 kgs per lactation.
- Bullocks despite lethargic and slow can be used for road and field work.

# Sahiwal







# Sahiwal

- Originated in Montgomery region of undivided India.
- This breed otherwise known as Lola (loose skin), Lambi Bar, Montgomery, Multani, Teli.
- Best indigenous dairy breed.
- Reddish dun or pale red in colour, sometimes flashed with white patches.
- Heavy breed with symmetrical body having loose skin.
- The average milk yield of this breed is between 1400 and 2500 kgs per lactation.

# Deoni



# Deoni

- This breed otherwise known as Dongerpati, Dongari, Wannera, Waghyd, Balankya, Shevera.
- Originated in Western Andhra Pradesh and also found in Marathwada region of Maharashtra state and adjoining part of Karnataka.
- Body colour is usually spotted black and white.
- Milk yield ranges from 636 to 1230 kgs per lactation.
- Caving interval average is 447 days.
- Bullocks are suitable for heavy cultivation.

# Tharparkar



# Tharparkar

- Originated in Tharparkar district (Pakistan) of undivided India and also found in Rajasthan.
- Otherwise known as White Sindhi, Gray Sindhi and Thari.
- They are medium sized, compact and have lyre-shaped horn.
- Body colour is white or light grey.
- The bullocks are quite suitable for ploughing and casting and the cows yield 1800 to 2600 kgs of milk per lactation.

# Jersey



# Exotic Breeds

## Jersey

- Originated from Jersey Island, U.K.
- Smallest of the dairy types of cattle.
- In India this breed has acclimated well and is widely used in cross breeding with indigenous cows.
- The typical colour of Jersey cattle is reddish fawn.
- Dished forehead; compact and angular body.
- Economical producers of milk with 4.5% fat.
- Average milk yield is 4500 kgs per lactation.

# Holstein Friesian





# Holstein Friesian

- Originated from the northern parts of Netherlands, especially in the province of Friesland.
- Largest dairy breed and ruggedly built in shape and possess large udder.
- Breeds have typical marking of black and white that make them easily distinguishable.
- The average milk production of cow is 6000 to 7000 kgs per lactation.
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# Brown Swiss



# Brown Swiss

- The mountainous region of Switzerland is the place of origin of Brown Swiss breed.
- Breeds are rugged in nature and good milk production.
- Average milk yield is 5000 kgs per lactation.
- The Karan Swiss is the excellent crossbred cattle obtained by crossing this breed with Sahiwal cattle at NDRI, Karnal.

# Guernsey



# Guernsey

- Originated from Small island of Guernsey in France.
- Cherry red to brown in colour. Mahogany and white is a variation in colour.
- The milk has a golden colour due to an exceptionally high content of beta carotene
- Guernsey cows produce around 6000 kgs per lactation.
- The Guernsey cow has many notable advantages for the dairy farmer over other breeds includes high efficiency of milk production, low incidence of calving difficulty and longevity.

# Cross-Breds

## Sunandini”

In 1963, the bilateral project was Indo-Swiss Project now named Kerala Livestock Development Board (KLDB) was started at Kerala using Brown Swiss and Jersey (5/8) on local Non- descript cows and a new breed of cattle “Sunandini” developed. Sunandini is a multipurpose breed for milk, draft and meat, this breed is now becoming exclusively a milch breed (Chacko, 1994). The overall lactation milk yield was 2435 kg in 280 days with 3.89 % fat.

- In 1963 at NDRI, Karnal crossbreeding of Sahiwal and Red Sindhi with Brown Swiss were initiated to evolve a new dairy breed.
- Brown Swiss breed famous for its high milk yield, better heat tolerance and draught capacity was chosen, the various crossbred groups were formed which had not shown significant heterosis for milk yield. All the
- various crossbred groups were merged and selective
- breeding was carried out.
- The Brown Swiss inheritance varied between 50-75 % and the rest from Sahiwal cattle, was the next best crossbred group (Thiagarajan, 2014).

# Karan Swiss

The creation of synthetic population following selection resulted into a new breed of cattle “Karan Swiss “in 1980. High producing crossbred females will produce 5000 to 6000 kg milk yield with a 4.78 % butterfat during lactation. The Karan Swiss breed is usually light gray to dark brown in color. In 1971 at NDRI, Karnal crossbreeding Holstein Friesian, Jersey and Brown Swiss sires semen was used on Tharparkar cows. The various crossbred groups were formed which had not shown significant heterosis for milk yield. All the various crossbred groups were merged and selective breeding was carried out. The Holstein Friesian inheritance varied between 50-62.5 % and the rest from Tharparkar was the next best crossbred group (Thiagarajan, 2014).



# Karan Fries

The colour of Karan Fries breed predominantly of black patches and sometimes is completely dark with white patches on forehead and tail.

The average 1st lactation milk yield was 3619 kg in 305 days. The average fat % ranged between 4.10 and 4.17 and SNF ranged between 8.58 and 8.75 %.

# Frieswal

- The Project Directorate on Cattle (PDC), Meerut has developed a National crossbred cattle
- Holstein Friesian - Sahiwal cattle cross, yielding 4000 kg of milk with 4% butter fat in a lactation of 300 days
- The chief body colour of Frieswal cattle was black and white

- Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri of district Ahmednagar, Maharashtra has developed a triple crossbred cow breed
- named “**Phule Triveni**” giving milk yield of 3000 to 3500 liter/lactation with 4% of fat. The new breed has been developed by crossing Holstein Friesian (50 per cent),
- Jersey (25 per cent) and Gir (25 per cent) breeds (Doiphode et al., 2008).

The genetic constitution of “**Vrindavani**” cattle carries 50–75% inheritance from exotic cattle breeds concerning Holstein-Friesian, Jersey and Brown Swiss and 25–50% from indigenous Haryana breed. The Vrindavani cattle exhibit almost all possible coat colors in addition to roan, light-dark brown, black and white and brown and white. The Vrindavani cattle yield around 3,000 kg milk in 305 days of lactation with 4–4.5% fat (DARE/ICAR, Annual Report, 2007-08).

# **Advantages of Crossbreeding**

Increase in crossbred cattle population, milk production and per capita of milk availability, lactation length, growth rate, decrease in age at puberty, age at first calving and calving interval (Tomar, 2009), higher birth weight of calves, better growth rates, better reproductive efficiency, advantage of breed complementarity and non-additive effects (dominance and epistatic) thus leading to heterosis (hybrid vigor). Heterosis tends to be most important for lowly heritable traits such as fertility and survival.

Heterosis makes crossbred animals more productive and better than either of the parental breeds. Crossbred animals are docile, can be easily handled and more suited for machine milking, Heat detection and artificial insemination is easier in cows. Price of crossbred cow milk is less in comparison to native breeds.

- **Disadvantages of Crossbreeding**

- Primary investment and maintenance expenditure is high. For less availability of good quality of feed and fodder the crossbred animals are susceptible to contagious diseases like Foot and Mouth disease, Babesiosis, Theileriosis, Mastitis, Milk fever, Ketosis etc. The crossbred animals are also most susceptible for heat stress, shock etc. Very high culling rate persists in crossbred's males (40-70 %) due to poor libido, semen quality and freezability (Sethi, 1989.) Cross breeding requires maintenance of two or more pure breeds in order to product the cross breeds. Disposal value of surplus crossbred male is trivial.

# • **Future Breeding Strategies for Development of Crossbred**

- **Cattle Strengthen the existing Artificial Insemination (AI) networking facilities to provide doorstep delivery to the farmers. Efforts should be made to improve the conception rate from AI. Rigorous selection especially of males with very high genetic merit along with good semen quality has to be done to bring faster genetic improvement. Proper replacement rate in females has also to be maintained to have optimum size of the herd**

Murrah





# Murrah

- **Most important breed of buffaloes whose home is Rohtak, Hisar and Sind of Haryana, Nabha and Patiala districts of Punjab and southern parts of Delhi state.**
- **Otherwise called as Delhi, Kundi and Kali.**
- **The colour is usually jet black with white markings on tail and face and extremities sometimes found.**
- **Tightly curved horn is an important character of this breed.**
- **Most efficient milk and butter fat producers in India.**
- **Butter fat content is 7.83%. Average lactation yield is varying from 1500 to 2500 kgs per lactation.**
- **Also used for the grading up of inferior local buffaloes.**

- Frequent urination. The urine coming in spurting action wetting the part of skin below vulva and above udder (perineum). The drying of the urine leaves white mark on skin.
- Buffaloes in heat remain restless, off feed, raising head in a typical fashion.
- Local non descript buffaloes bellow, become restless and remain off feed. Milk yield is reduced. The bellow is sharp and for longer duration.
- The buffaloes expose their teeth while bellowing which is very characteristic.
- The mucus discharge, in buffaloes is seen in about 49% cases. It is thin on the day of heat, become thick as the time passes and changes the colour from clear to white.
- 60-70 % of the buffalo come in heat from 6 pm to 6 am (after sunset and before sunrise) and this should be borne in mind and attendant should watch the buffaloes in the evening and early morning for expression of heat symptom.
- Teaser bull (Vasectomised bull), can be used for parading in buffalo barn for detection of heat
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# Bhadavari



# Bhadawari

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- Home tract of this breed is Agra and Etawah district of Uttar Pradesh and Gwalior district of Madhya Pradesh.
- Medium sized buffalo.
- The body is usually light or copper coloured is a peculiarity of this breed. Eye lids are generally copper or light brown colour.
- Two white lines 'Chevron' are present at the lower side of the neck similar to that of Surti buffaloes.
- The average milk yield is 800 to 1000 kgs per lactation.
- The bullocks are good draught animal with high heat tolerance.
- The fat content of milk varies from 6 to 12.5 per cent. This breed is an efficient converter of coarse feed into butterfat and is known for its high butter fat content.
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# Nili Ravi



# Nili Ravi

- Originated around the river Ravi.
- This breed is found in Sutlej valley in Ferozpur district of Punjab and in the Sahiwal (Pakistan) of undivided India.
- The peculiarity of the breed is the wall eyes.
- Head is small, elongated, bulging at top and depressed between eyes.
- Horns are very small and tightly coiled.
- Bullocks are good for heavy trotting work.
- The milk yield is 1500-1850 kgs per lactation.

# Mehsana



# Mehsana

- Mehsana is a dairy breed of buffalo found in Mehsana, Sabarkanda and Banaskanta districts in Gujarat and adjoining Maharashtra state.
- The breed is evolved out of crossbreeding between the Surti and the Murrah.
- Body is longer than Murrah but limbs are lighter.
- The horns are less curved than in Murrah and are irregular.
- Bullocks are good for heavy work.
- The milk yield is 1200-1500 kgs per lactation.



| Particulars                    | Indigenous                         | Exotic / Crosses | Buffaloes    |
|--------------------------------|------------------------------------|------------------|--------------|
| Age at puberty                 | 24 months                          | 12-15 months     | 24-30 months |
| Age at first mating            | 30 months                          | 18-20 months     | 30-36 months |
| Optimum weight at first mating | 250 kg                             | 180-275 kg       | 300-350 kg   |
| Oestrus cycle length           | 17-24 days                         | 21±3             | 21 days      |
| Duration of oestrus            | 12-18 hours                        | 12-18 hours      | 12 -18 hours |
| Time of ovulation              | 12-16 hour after end of estrus     |                  |              |
| Optimum time of insemination   | Mid heat / towards the end of heat |                  |              |
| Gestation period               | 280-290 days                       | 280 - 290 days   | 305-318 days |
| Dry period                     | 80 -90                             | 60 - 70          | 90 - 120     |
| Calving to first heat          | 40 days                            | 40 days          | 40 days      |
| Calving to first service       | 60 days or less                    |                  |              |
| Lactation length               |                                    | 305              |              |
| Milk yield in litres           | 1500-2000                          | 3500-5000        | 1500-3000    |
| Birth weight                   | 20 -25                             | 25-35            | 30-40        |

# Heat detection in buffaloes

- Cows do mount over other cows when they are likely to come in heat and stand for mounting when they are in good heat. This is not seen in buffaloes. Buffaloes neither mount on other buffaloes nor other buffaloes mount on buffaloes in heat. In buffaloes copious ropy hanging discharge is not seen on the contrary it gets suddenly dropped and is not noticed by the owner and the discharge is scanty. Some buffaloes do not bellow and show silent heat, especially high yielding buffaloes.
- The main heat symptoms of buffaloes are as follows. The vulva becomes edematous, swollen. The lower portion of vulva looks oily. The gap is seen between vulvar lips and slight opening is seen. The wrinkles which are present in anoestrus buffalo become shallow or vanish.
- The mucous membrane of vulva becomes reddish, moist and glossy.
- Mucus discharge which is not seen normally can be seen before or after oestrus spontaneously.
- The colour, consistency and fern pattern of mucus help in determination of correct oestrus.
- Engorgement of teats in lactating buffaloes which is due to holding of milk following increased estrogen level in blood is seen when they are in heat.

- Frequent urination. The urine coming in spurting action wetting the part of skin below vulva and above udder (perineum). The drying of the urine leaves white mark on skin.
- Buffaloes in heat remain restless, off feed, raising head in a typical fashion.
- Local non descript buffaloes bellow, become restless and remain off feed. Milk yield is reduced. The bellow is sharp and for longer duration.
- The buffaloes expose their teeth while bellowing which is very characteristic.
- The mucus discharge, in buffaloes is seen in about 49% cases. It is thin on the day of heat, become thick as the time passes and changes the colour from clear to white.
- 60-70 % of the buffalo come in heat from 6 pm to 6 am (after sunset and before sunrise) and this should be borne in mind and attendant should watch the buffaloes in the evening and early morning for expression of heat symptom.
- Teaser bull (Vasectomised bull), can be used for parading in buffalo barn for detection of heat

# Other methods to detect estrus

- Crystallization pattern of cervical mucous will show long crystals in a typical fern-like pattern
- There are many estrus-detecting devices available. They are usually attached to the tail or rump of the cow.
- Mounting causes these devices to discharge a coloured fluid which can be observed afterwards even from the distance.
- 'Chin ball mating device' can be used for heat detection. It works on the same principles of a ball point pen and is fixed by means of a halter below the chain of the teaser bull. When the checking animal mount the cow in heat, the dye exuded round a spring-loaded ball of the device marking the back of the cow.
- Russian workers have developed an instrument basically consisting of an ohm meter and electrodes. When applied to the mucous membrane of the vagina, the resistance indicated on the ohm meter shows whether the cow is in heat.
- Pedometer is an instrument used to monitor the movement of animal. The principle is the activity and movement of the cow increases on the day of heat and this can be detected by means of a pedometer tied to the leg of the cow.
- The vaginal temperature can be recorded, which gives an indication about the heat. Generally during estrus, the vaginal temperature increased by about 1°C on the day of heat. Both methods are not very practicable.
- The methods described above had little applicability in developing countries due to technological and economical and managerial reasons. Close observation of signs of heat, standing heat remains the most practicable method of heat detection.
- In large farm this can be supplemented with a bull-parade using a teaser bull. A teaser may be a vasectomised bull or bull in which penis has been amputated and the urethra exteriorized.
- An intact bull can also be used by hanging a thick cloth or gunny bag curtain in front of the penis preventing entry of penis and mating.
- Special care should be taken to prevent spread of disease by teasers. Vasectomised bull is more harmful in this regard.

# Time of insemination

- Ovulation takes place about 12 hours after the end of estrus. It takes another six hours for it to travel half-way down the oviduct.
- The sperm, even though reach the oviduct within minutes after insemination, must be exposed to the female reproductive tract for about 6 hours to attain the capacity to fertilize.
- This process of preparing the sperm for fertilization is known as capacitation.
- Sperm are viable for 24 hours in the female reproductive tract whereas the ovum remains fertile for only about 10 hours after ovulation.
- This implies that mating or insemination between mid-estrus (middle of standing heat followed by another insemination in about 6 hours after that).
- As a routine practice, if a cow is seen showing signs of early heat in the morning, it may be inseminated in the evening.
- If such signs are first manifested in the evening, the cow may be bred next day morning.
- A cow is expected to show estrus in 30-40 days after calving. Cows that fail to show heat even after 50 days have generally some problem and need examination.
- It may be due to infection or malnutrition and remedial measures may be taken accordingly.
- Insemination should be done only when buffalo is in standing heat. In buffalo to understand standing heat one should know the symptoms of heat.
- Buffaloes normally are not seen standing for mounting by herd mates but standing heat can be known from the changing colour of mucus discharge which is early estrus is clear and watery but in standing heat or mid heat the colour is changed to little buffy with thick consistency.
- In mid heat the oedema of vulva is intense there is little gap in vulvar lips and lower lip looks oily.
- The vulvar mucus membrane is glossy reddish or pink and wet.

# Package of practice to improve reproductive efficiency

- Accurate record kept is very important in ensuring reproductive efficiency in the herd.
- Their production detail like date of estrus, date of service and calving should be maintained properly.
- This data should be used to predict the probable date of heat, such animal should be watched carefully in the morning and evening for signs of heat.
- In larger dairy farm teaser bulls can be put in use.
- Complete breeding history, past performance and difficulties of an individual cow should be maintained.
- Irregular estrus and abnormal discharge should be attended immediately.
- The cows with retained placenta should be treated promptly and when such cows are put in breeding next time, the reproductive tract should be examined thoroughly for involution and possibility of infection.
- A manager should examine a cow 24 to 36 hours after service for metestrus bleeding. If it occurs under 24 hours after service, the cows were bred too late.
- If it occurs over 36 hours after service, they were bred too early during estrus. This will help in pinpointing of failure of conception.
- Cow should be examined for pregnancy 45 to 60 days after service so that if they are non-pregnant, steps can be taken to re-breed them at the earliest opportunity.

- If the conception rate under A.I is lower than natural service, time of insemination, insemination technique and quality of semen must be checked.
- Short irregular cycles indicate cystic ovaries, short and long irregular interval point to missed heat.
- Silent or quiescent heat : the behavioural manifestation of heat may be very weak or imperceptible in such case. It is very common in buffaloes. But there is a normal ovulation and if inseminated at proper time the animal can conceive.
- Cows go through the normal ovarian changes of the estrus cycle except the behavioral heat and sexual receptivity.
- It is more in summer season than other seasons and more in heifer than adult animals.
- Use of balanced feed, proper summer management, use of teaser bulls can be of use tool in detecting silent heat.
- Anestrus or absence of sexual cycle may be due to under developed genitalia or due to persistent CL. In the former case follicle fail to develop and a heifer will not come to heat at all.
- One of the major causes of under developed genitalia is malnutrition. Besides there can be genetic causes.
- The second probability is the anestrous also may be due to persistent CL, due to certain hormonal disturbances, the C L persist beyond the life expectancy in a normal cycle, thereby preventing further cycling. A common cause for persistent CL is endometritis of the uterus.
- Sometime anestrus is often observed in the early post partum period when the lactation is strong, probably due to the influence of lactation(due to secretion of prolactin)

# **A1 vs A2 Cows Milk: What's the Difference, Benefits, & Nutrition**

- **Milk contains two major groups of proteins — caseins and whey proteins. A2 milk contains the A2 type of beta-casein protein whereas A1 milk contains A1 type of beta casein. A1 protein is a natural mutation of A2 which occurred over 1,000 years ago and on its digestion, A1 protein produces beta-casomorphin-7 (BCM-7).**



# What Is Wrong with A1 Milk?

- At present, there are two types of cow's milk available in the market, [A1 and A2 milk](#).
- The majority of cows that are being raised in the United States and other parts of the globe are A1 variety.
- Milk produced by A1 cows supposedly produces opiate-like effects resulting in the development of mild to serious medical conditions ([2](#)).
- Prominent professor **Bob Elliot** from the University of Auckland claims that a switch to A2 milk can ultimately solve all problems that 1 in every 4 Americans have in relation to dairy consumption ([4](#)).

# The Difference Between A1 and A2 Milk

- The protein component in milk is made up of up to 80% casein ([1](#)).
- Milk has several types of casein and beta casein is the second most common type casein in cow's milk. Beta-casein comes in 13 different forms

- **A1 beta-casein** comes from the most common cow breed that originated in Australia, United States, and Northern Europe. Holstein, Friesian, Ayrshire, and British Shorthorn features A1 beta-casein genetic material. A1 beta-casein can be found on all commercially-prepared milk.
- **A2 beta-casein** is protein found in milk produced by 'old-fashioned' cows like the Jersey, Charolais, Guernsey, and Limousin. Milk produced by other mammals such as those from human, goat, and sheep is similar to A2 dairy milk mainly due to the presence of proline ([6](#), [7](#)).
- A1 is considered a genetic mutation that results in the production of the compound BCM7 assumed to be causing the development of unwanted [health](#) conditions and illnesses among consumers

# When Did the A1 Mutation Start?

- The A1 gene mutation began hundreds of years ago from Holstein cow breed that was then passed onto other breeds ([8](#)).
- This mutation of the A1 beta-casein proved to be highly beneficial to dairy farmers who wanted to increase milk production without the added costs.
- A2 milk is found in milk and dairy products produced by older cow breeds, have not been manipulated in any way.
- Thus many regard it as the better type of casein protein. It is found in milk we consume along with A1 milk.
- A2 milk is produced by [A2 Milk Company](#), and contains no A1 beta-casein.
- **KEY POINT:** *The difference between A1 and A2 is in the amino acid chain number 67.*
- *At this position, A2 features proline whilst A1 is linked with histidine.*
- *This mutation in the amino acid chain link of A1 milk is supposed to cause adverse effects in humans, whilst making A2 milk the healthier option.*

# What is BCM7

- **BCM7 (Beta-casomorphin-7)**, an [opioid peptide](#) in A1 beta-casein is produced as a result of the breaking off of histidine in the number 67 amino acid chain during digestion ([9](#), [10](#)).
- BCM7 is the reason why regular cow's milk is considered to be a less healthy option than milk containing A2 beta-casein.
- BCM7 found in A1 milk is known to have opioid or narcotic side effects and is identified to be the culprit of [lactose intolerance](#) in 1 out of 4 Americans.
- The absorption of BCM7 into the bloodstream leads to the high incidence of autism, schizophrenia, and other neurological disorders ([11](#), [12](#), [13](#), [14](#)).
- Despite extensive and ongoing research, the extent of BCM-7 absorption into the bloodstream still remains unknown.
- Studies reveal that BCM-7 is absent in the blood of healthy adults, whilst presence of BCM-7 in infants is a possibility ([15](#), [16](#), [17](#)).
- **KEY POINT:** *The presence of BCM7 in A1 milk makes it a less attractive dairy option due to the problems that are assumed to develop as a result of consumption of A1 milk.*

# Risk of Type 1 Diabetes Mellitus

- [Type 1 Diabetes Mellitus](#) is an autoimmune disease that typically develops in children. The illness is characterized by the inability of the body to produce insulin.
- Based on epidemiological evidence, the consumption of A1 milk is a contributing factor in the increased risk of development diabetes type 1 among children ([12](#), [15](#), [18](#), [19](#)).
- Human breast milk contains A2 beta-casein only whereas pasteurized milk formulations may either contain A1/A1 beta-casein or A1/A2 beta casein.

- According to a 1992 observational study by Elliot RB, there was low incidence of diabetes mellitus type 1 among infants who were breastfed in the Polynesian Islands as opposed to Polynesian infants in Auckland that were supplied with commercial milk formulations containing A1 beta-casein ([20](#)).
- Observational studies were insufficient to prove that A1 milk may cause type 1 Diabetes, but only showed that those who consumed more A1 beta-casein are likely to develop insulin-dependent diabetes.
- There are also reports that show no difference in the effects of A1 and A2 milk in children.
- Lastly, a few studies claim that milk containing A1 beta-casein has no effect on prevalence of diabetes type 1 altogether ([18](#), [21](#), [22](#), [23](#)).
- **KEY POINT:** *A1 beta-casein is assumed to stimulate the development of type-1 diabetes in children.*

# Does A1 Milk Harm Your Heart?

- According to New Zealand research conducted by CNS McLachlan, the regular intake of common milk containing A1 beta-casein inspires the development of coronary heart disease ([24](#)).
- The findings of McLachlan are supported by ecological data produced after extensive testing on rabbits.
- The test rabbits that were supplied with A1 beta-casein featured larger areas of fatty streaks in the aorta while those that received A2 milk came up normal.
- Apart from fatty streaks, rabbits nourished with A1 milk had higher levels of LDL cholesterol as opposed to those that received A2 milk for 6 weeks ([12](#),[19](#)).
- The experiment on rabbits clearly showed that the accumulation of fats may potentially clog and block blood vessels that may result in heart disease.
- Unfortunately, the relevance of these findings for humans is still up for debate ([6](#), [25](#)).
- To date, there are only two human studies that have tested the effects of A1 beta-casein as a predisposing factor of heart disease.
- One study included 15 male and female test subjects with known high risk of heart disease.



# Does A1 Milk Cause SIDS?

- The most common cause of death in infants less than one year of age is identified to be [Sudden Infant Death Syndrome](#) or SIDS.
- It is unexpected infant death without clear or visible cause ([28](#)).
- Some researchers hypothesized that BCM-7 from A1 beta-casein may be the culprit in some cases of SIDs.
- As some mothers may opt to breastfeed their babies up to 2 years of age, there are also those who prefer to provide their newborns with instant milk formulations instead ([29](#)).
- In one study, high levels of BCM-7 in the bloodstream were found among infants suffering from sleep apnea or temporary breathing patterns [during sleep](#).
- Sleep apnea has been linked to an increased incidence of SIDS ([15](#)).

- BCM-7 penetration into a newborn's central nervous system may potentially inhibit normal respiratory system functioning as evidenced by abnormal respiratory breathing, hypoxia, and excessive levels of carbon dioxide resulting in sudden death ([30](#)).
- Results obtained from these studies also tell us that some children may be suffering from hypersensitivity issues to A1 beta-casein in cow's milk.
- More studies should be implemented before any solid conclusions can be made to connect A1 milk consumption with SIDS.
- **KEY POINT:** *Due to limited studies, there are no concrete evidence that can link SIDS to the death of infants that exclusively consumed A1 milk formulations.*
- *More research is needed to prove the hypothesis that A1 milk is a contributing factor to increased risk of sudden death in infants.*

- The crossover design of the study meant that participants consumed both A1 and A2 beta-casein at different periods of time ([26](#), [27](#)).
- The results derived from the study tell us that there are no serious adverse effects on heart disease risk factors.
- When compared alongside A2 beta-casein, A1 showcased similar effects on blood pressure levels, blood vessel function, blood fats concentration, and inflammatory markers ([27](#)).
- Based on the results derived from the other study, there are no significant differences in the effects of A1 and A2 beta-casein on blood cholesterol levels ([26](#)).
- **KEY POINT:** *Despite numerous studies that point to the increased risk of coronary heart disease in animals, there are no solid evidence that can confirm the negative effects of A1 beta-casein in humans.*

## Is There a Direct Relationship Between A1 Milk and Autism?

- Autism is a developmental disorder characterized by disabilities including problems with social interaction, communication, and repetitive behaviors.
- It was theorized that BCM-7 plays a crucial role in the development of autism in children.
- Although there have been numerous studies trying to link A1 milk to autism, there are still no solid proof that can verify this hypothesis ([31](#), [32](#), [33](#)).

- In a study conducted by Russian researchers, high amounts of BCM-7 were found in the urine of infants with autism that were fed with milk formula.
- Over time, there were infants that showed the ability to metabolize BCM-7 at a fast rate, whilst there are those who showcased inability to process and excrete BCM-7 and other peptides altogether.
- The study also reveals that those who were fed with formula milk exemplified delayed psychomotor development as well as high levels of BCM-7 in their bloodstream.
- On the other hand, infants with autism that were breastfed or those under Gluten-free, Casein-free or GFCF diet displayed more developmental improvements with no traces of BCM-7 in their bloodstream ([14](#)).
- Due to some observation from these studies, there are some nutritionists who have started recommending parents of children with autism to start supplementing their [diets](#) with A2 milk.
- Making the switch from common A1 milk to A2 milk is supposed to be beneficial for child afflicted with autism.

# Is A1 Milk the Major Cause of Lactose Intolerance?

- Based on studies, 1 in 4 Americans suffer from lactose intolerance - the inability of the digestive system to process milk resulting in the development of unpleasant symptoms such as stomach upsets, diarrhea, flatulence, and bloating to name a few.
- A1 and A2 milk feature the same lactose concentrations.
- The makers of A2 milk contend that lactose is not the real suspect for the development of lactose intolerance, but a mutation caused by A1 beta-casein, a compound found in store-brought milk and dairy products.
- Some researchers say drinking A2 milk causes less digestive issues than milk containing A1 beta-casein ([37](#), [38](#)).

- Studies that support these claims reveal that apart from lactose, there are other milk components that bring about unwanted digestive problems.
- It was also suggested by scientists that certain proteins present in milk may be the major suspects in some cases of milk intolerance.
- In one study involving 41 men and women, results revealed that drinking A1 milk may result in softer stools than A2 milk consumption in some test subjects.
- Additional studies in rodents implicate that A1 milk may be a predisposing factor to increased inflammation in the digestive system ([39](#), [40](#), [41](#)).
- **KEY POINT:** *Although there are reports that show positive benefits of drinking A2 milk, there is not enough data to support the hypothesis that A1 beta-casein can trigger or worsen the symptoms of lactose intolerance.*

- **A2 Milk from Native Indigenous Breed Cows**
- A2 milk is produced by native indigenous breed cows namely Gir, Sahiwal, Tharparkar, Rathi, Deoni and Red Sindhi. These milking breed cows are known for its' best milking prowess. Milk obtained from these breeds is proved to be medicinally rich having many curative and healing properties against many diseases. The milk contains beta-casein protein beta laef albumin, medicinal compounds having anti-cancer properties like Glucolyte, Dephthenotoxin, Phenol and 4-Methyl that makes it superior than A1 milk.



- A1 milk consists of mutated beta casein. This milk is produced by exotic European breeds namely Jersey and Holstein Friesian (HF). These cross-breeds are also referred as 'urus' or 'aurochs' in foreign countries. High milk yielding ability is its' unique feature. These breeds have captured more than 80% of dairy farms across the globe including India.

- Consistently for past many years Indian desi cows are getting replaced by Jersey and HF dairy animals because the later yield milk as high as 25 liter/day whereas Indian breed cows yield less than 15 liter/day. However, the nutritive value of the A2 milk produced by our country's desi cows is surmountable when compared with A1 milk. These days with increased awareness on health and nutrition, demand of A2 milk is increasing. Dairy farmers across the country are getting inclined towards rearing Indian breed cows but lack the knowledge on buying, rearing, breeding and managing the same.

- Major improvements have been observed among children who regularly consume A2 milk sourced from Guernsey cows due to its high A2 beta casein at 95%.
- Those who opted to provide their children with A2 milk also reported improvement in digestive function, communication skills, and eye contact.
- Another study reveals that drinking cow's milk over time may potentially exacerbate the symptoms among children with autism.
- There are also studies that showed that drinking A1 or A2 milk has no effect on overall behavior ([34](#)).
- With autism, there are more than one cause to its development.
- There is not enough human trials that can prove the hypothesis that A1 and A2 milk have significant impact on the incidence and severity of autism symptoms ([35](#), [36](#)).
- **KEY POINT:** *Despite numerous studies that link autism symptoms to A1 milk consumption, researchers still need to find out more solid connections for the negative effects of A1 milk among children with autism.*

