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PLATELET RICH PLASMA THERAPY

Introduction

Platelet-rich plasma (PRP) has gained popularity recently as a treatment to enhance tissue healing. The term platelet-rich plasma may be applied to any part of autologous blood that contains a higher concentration of platelets. Recently, PRP has been utilized for numerous musculoskeletal indications

PRP induces musculoskeletal healing through a number of effects. As a treatment modality for tendon healing, PRP enhances the mobilization of circulation-derived cells. Compared to serum, PRP has been shown to significantly increase the deposition of a collagen-rich extracellular matrix, with higher collagen content compared to placebo. Once PRP enhances the early phase of regeneration, mechanical stimulation is required to promote organized collagen synthesis and remodelling during new tendon development. PRP contains higher concentrations of certain growth factors, in particular platelet-derived growth factor (PDGF) and transforming growth factor- β

What are Platelets?

Platelets, also called thrombocytes are a component of blood whose function is to react to bleeding from blood vessel injury by clumping, thereby initiating a blood clot. Platelets have no cell nucleus: they are fragments of cytoplasm that are derived from the megakaryocytes of the bone marrow, and then enter the circulation. Low platelet concentration is called thrombocytopenia, and is due to either decreased production or increased destruction. Elevated platelet concentration is called thrombocytosis, and is either congenital, reactive (to cytokines), or due to unregulated production.

WHAT IS PLATELET RICH PLASMA?

Platelet rich plasma, commonly referred to as "PRP", is a non-operative, permanent solution for conditions such as arthritis and ligament/tendon sprains and tears. Utilizing the body's natural healing process, PRP therapy is a concentration of platelets that are injected into the damaged ligaments, tendons, and joints to promote tissue repair and accelerate healing. Platelets are rich in growth and healing factors which means, on average, an injured individual can get back to a pain-free life in four to six weeks.

PRP was made popular by professional athletes and weekend warriors through its treatment of season-ending symptoms including swelling, stiffness, inflammation, tenderness, and pain.

PROCEDURE FOR PREPARATION OF PRP

The veterinarian collects your pets blood in a blood collection vial containing ACD-A/EDTA, the collected blood is then centrifuged at 1000 rpm which separates the blood into three different layers(Plasma, Buffy coat, RBC), depending on the density of the blood cells. The top most separated part that is Platelet Poor Plasma is discarded and the middle Platelet Rich Plasma along with the buffy coat is collected in a vial without any anticoagulant. This vial is centrifuged again 2800-3000 rpm for 10 minutes to filter out the Platelet Rich Plasma.

■ ELIGIBILITY

- The animal should be healthy
- The animal should not be under stress
- The animal should not be under any treatment
- The animal should be in the normal weight range (species and breed wise)
- Normal organ functionality: Liver, Kidney, Spleen etc.
- No chronic Skin or Liver diseases
- The animal should be free from any kind of infection or transmissible diseases
- No Blood disorder
- Should not be on any antibiotics, vitamin & mineral supplements
- No immunization in the past one month

PRP THERAPY

1. The procedure should be performed under controlled sterilised environment,
2. Blood collection and PRP preparation should be done prior to sedation
3. The patient should be sedated and preparation of site along with local anaesthetic infiltration should be done.
4. Locating the target site with imaging techniques like USG, Endoscopy (Arthroscopy), Real time C-arm Xray.
5. Needle (21 G) is inserted in the target site with the help of imaging tools
6. The separated PRP is mixed with Calcium Chloride 10% for platelet activation
7. The mixture is then immediately deposited at the target site.

INDICATIONS

- Hip dysplasia,
- Tibial plateau levelling osteotomy
- Plastic cosmetic surgeries,
- Scalp regeneration,
- Musculoskeletal pathologies,
- Osteoarthritis,
- Tendinopathy,
- Ligament injury,
- Orthopaedic surgeries,
- Open wound healing.

SIGNIFICANCE

The following Growth factors are present in platelet-rich plasma.

Name	Acronym	Function
Platelet-derived growth factor	PDGF	Stimulates fibroblast production, chemotaxis, stimulates transforming growth factor- β 1, collagen production, upregulation of proteoglycan synthesis
Transforming growth factor- β 1	TGF- β 1	Modulates proliferation of fibroblasts, formation of extracellular matrix, cell viability; increases production of collagen from fibroblasts, suppression interleukin 1-mediated effects on proteoglycan synthesis in cartilage
Basic Fibroblastic growth factor	bFGF	Produces collagen; stimulates angiogenesis, proliferation of myoblasts
Vascular endothelial growth factor	VEGF	Promotes angiogenesis
Epidermal growth factor	EGF	Promotes cell differentiation, angiogenesis, proliferation of mesenchymal and epithelial cells

SUCCESS RATE

The rate of success according to the author Jeff Mayo, DVM suggests that dogs under the age of 10 with significant lameness show the best response, with 91% of them experiencing a clinically compelling improvement in lameness when rated by both pet parents and Veterinarians alike.

CARE TO BE TAKEN DURING AND AFTER PROCEDURE

- Take proper anaesthetic measures prior to the procedure.
- Maintain sterility during the entire procedure
- No anti-inflammatory drugs should be administered during the course of treatment.
- No immunisation should be done at least a month before the procedure,
- No supplements, vitamins, blood thinners should be given
- Provide adlib amount of water
- Provide proper rest
- No strenuous activity should be done

FAQ's

What is Platelet Rich Plasma (PRP)?

Platelet Rich Plasma or PRP is a type of Regenerative Injection Therapy use to treat many soft tissue injuries (tendons and ligaments).

How is PRP therapy performed?

PRP involves taking blood from a vein and placing it into a special centrifuge. The platelets are separated from the rest of the components of the blood. The platelets are combined with a special substrate to enhance the effects. This is then injected into the injured or damaged area. Once healing takes place, over the course of a few weeks, the pain should lessen.

Is this the same as a cortisone injection?

No. Cortisone injections are a synthetic corticosteroid that is injected in the joints or areas of soft tissue to reduce pain and inflammation. While cortisone injections in limited amounts can be helpful, they do not alter the underlying cause (disease process) and therefore often have to be repeated. There are many documented risks of having "too much cortisone" and suppression of the immune system. PRP involves using the patient's own blood which contains natural growth factors that promote regenerative of tissue and decreased inflammation. PRP is aimed at being a curative treatment, whereas cortisone is not. PRP does not carry the same side effects as cortisone.

What musculoskeletal conditions can be treated with PRP?

Neck and back pain, knee pain, knee bursitis, patellar Luxation, tendon and ligament damage, osteoarthritis, hip dysplasia, chronic injuries, etc.

How do I know if my pet is a candidate for PRP?

A consultation is required before any treatment may take place. The consultation includes a comprehensive review of your pet's complaints, medical history and a thorough examination will be conducted. Diagnostic studies will be reviewed and/or ordered at the time of the consultation to determine the cause of your complaint(s). Once a diagnosis is established, we will discuss treatment options with you including if your pet is a candidate for PRP.

Is PRP painful?

While every animals pain tolerances vary, patient's show a range of discomfort from mild to moderate with PRP injections. A needle is used to draw blood from a vein in the limb initially and then small needles are used to perform the actual injection(s).

How many injections will my pet need?

This is no universal answer to this question. Typically 1 to 3 injections. Much of this depends on the chronicity and location of the problem. Some patients can successfully be treated with one injection cycle while others require multiple injections over a time period to eliminate or reduce pain to an acceptable level.

How do I know if PRP has helped my pet?

The answer to this is simple. PRP does not "mask" the pain and other symptoms like pain medication. If PRP has helped y, you will notice a difference in your pets overall pain level and function. Many patients will show an

increase in overall pain levels initially, but as the healing process occurs, symptoms are expected to resolve gradually over the course of 4 to 6 weeks on average. Much depends on the patient's overall level of health, age, diet, and activity levels. For some patients, repeat treatments may be needed.

How long does the effect from PRP last?

This is different for everyone. Much depends on the underlying disease process and whether there has been a recurrent injury to the affected area. It is impossible to predict if and when further treatments will be needed for a specific condition. In some cases, patients do come back months or years later for repeat PRP injections.

What are the possible side effects?

As with any type of injection, there is a small risk of infection, injury to blood vessels and risk of bleeding. There is a small risk of injury to a tendon or ligament when injected. While not truly considered a side effect, many patients will experience increased pain or discomfort for a temporary period following the treatment. If your pet has been ill or running fever, it is advisable to discuss this with the physician before considering this treatment.

Can my pet be allergic to the solutions injected?

Although extremely rare, some patients may have an adverse reaction to their own serum. It is also possible to have a reaction to the substrate that is used.

What is the success rate of PRP?

The success rate of PRP therapy varies considerably. Much depends of the condition being treated, health status of the patient, age, and treatment protocol. Success is also highly subjective and dependent on the patient's perception. Success rates reported in the literature have been largely anecdotal. PRP success in the treatment of Achilles tendonitis has been reported 70-80% and Osteoarthritis 80-90%.

If PRP is so great then why have I not heard about it before?

As previously mentioned, the use of PRP has really accelerated within the last decade. Newer techniques, protocols, and trials continue to take place and provide a greater understanding behind this technology. PRP therapy is not something that is commonly taught as a part of a standard veterinary school curriculum. As the treatment for many diseases and disorders continues to evolve, we continue to expand on traditional treatments in search of ones that are more efficacious and safe.

What can my pet do after having PRP? Activity levels?

It is recommended that your pet drink plenty of fluids following your treatment. Your Veterinarian will advise you to limit strenuous activity. You should also avoid the use of anti-inflammatory medications for at least 4 weeks. These medications inhibit the body's ability to heal. It is important that you also complete follow-up visits so that the physician can evaluate your progress. Skipping appointments and waiting too long may compromise the effect of future treatments.

I keep hearing about 'stem cells'. What is the difference between PRP and Stem Cells?

PRP contains natural growth factors and vital proteins that can help heal injured areas of soft tissue. Following injection of PRP, stem cells are recruited to the area to promote tissue healing. Stem cell therapy is much more powerful than PRP. In stem cell therapy, new cells are created to grow new tissue and heal disease.

Often the treatments are combined as combined as platelets are necessary to recruit stem cells and are essential for tissue healing.

In general, PRP is used to treat conditions that often have the ability to heal themselves but may require a "jumpstart", whereas stem cells are used in cases of more advanced conditions such as degenerative arthritis, bony defects, and in cases of spinal disc degeneration.

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MACERATION OF FOETUS

Case of 8 month pregnant Heifer (3 years old) was reported to Veterinary Dispensary Usgaon on 13th Aug 2018 with following history.

- 1) A.I Done on 12 th Dec 2017
- 2) Foul smelling Discharge from Vagina.
- 3) No signs of parturation.
- 4) No anorexia.

Clinical Observation:-

- a) Foul smelling Discharge
- b) Rectal examination revealed contracted Uterus with bony crepitating mass.
- c) Per vaginal Examination found bony structure trapped in the Vagina.
- d) Two finger dilatation of cervix.
- e) No elevation of temperature

Treatment Given:-

- bony structure present in the Vagina removed Manually.
 - injected with PGF2 alfa,
 - infused 3 liters of warm water in to the cervix for dilatation.
- with above no cervical dilation happened.

So finally decided to go for surgical intervention.



Procedure followed.

- A) injected with 0.75 ml of Xylazine with local anaesthesia with Lignocain 2% soln.
- B) left flank was prepared for surgery
- C) Laparohysterotomy was performed and macerated foetus bones was removed.
- D) Uterus washed with N.S and Enrogil I/U
- E) Uterus sutured with cushing suture using Chromic catgut.
- F) Antibiotic course was given for eight days.

Suture was removed on eleventh days.

Presently cow is giving about 6 liters of milk per day



Dr. Rama Parab

A GIANT LEAP FORWARD

IN TICK AND FLEA PROTECTION

Bravecto. A safe, effective, easy-to-give prescription in a chew that extends protection against ticks and fleas that threaten dogs everywhere.

Bravecto marks a major advancement in the science of treating against ticks and fleas. For years, people relied on shampoos, powders, sprays and collars with limited success. Monthly administered products were introduced in the '90s. But, even the best of these topical and oral treatments are only effective for four weeks. Now, one Bravecto chew.

THE BIGGEST BREAKTHROUGH IN OVER A DECADE

Bravecto's immediate and persistent protection is all thanks to its breakthrough molecule: fluralaner. This active ingredient is a unique member of the isoxazoline family - the first new insecticide class in over a decade - and has no known insect or tick resistance.

THE FLURALANER MOLECULE

Once Bravecto is administered, it is readily absorbed into the dog's blood stream from the stomach. Fluralaner works safely and systemically inside the dog. The fluralaner molecule then distributes and persists for up to 3 months.

UNIQUE MODE OF ACTION

- Fluralaner is a potent inhibitor of parts of the arthropod nervous system
- It acts antagonistically on two different ligand-gated chloride channels (GABA-receptor and glutamate-receptor)
- Fluralaner has selective inhibitory activity on insecticidal/acaricidal targets
- Fluralaner has less pronounced activity on the tested mammalian GABA-receptor indicating a high safety margin
- Inhibitory glutamate-gated chloride channels exist in arthropods, not in mammals

PROTECT DOGS AGAINST COMMON ECTOPARASITES

TICKS	FLEAS	MITES	MANGE
Rhipicephalus sanguineus	Ctenocephalides felis	Demodex spp.	Sarcoptic
Dermacentor variabilis	Ctenocephalides canis	Otodectes Spp.	
Dermacentor reticulatus			
Ixodes holocyclus ,Ixodes scapularis, Ixodes hexagonus Ixodes Ricinus			

A SINGLE BRAVECTO TREATMENT RESOLVED SIGNS OF FAD IN ALL TREATED DOGS

- JUST ONE DOSE CAN DRIVE FLEAS IN A HOUSEHOLD TO EXTINCTION⁷
- IN A CONTROLLED STUDY, BRAVECTO PREVENTED THE TRANSMISSION OF BABESIOSIS
- BRAVECTO KILLS TICKS BEFORE THEY ENGORGE,⁸ THUS HELPING REDUCE THE RISK OF TICK-BORNE DISEASES

EXCEPTIONAL SAFETY FOR ONE AND ALL

Bravecto has an excellent safety profile. We put our treatment to the test with comprehensive safety studies that stand up to all scrutiny, so when you prescribe Bravecto to the dogs in your care, you can do so with confidence. Bravecto is proven safe for dogs, and no interactions using Bravecto alongside other commonly used medicines were observed:

Feel free to prescribe Bravecto for:

- PUPPIES OVER 8 WEEKS
- DOGS OVER 2KG
- DOGS TREATED WITH THE SCALIBOR COLLAR
- BREEDING, PREGNANT AND LACTATING DOGS
- IVERMECTIN-SENSITIVE DOGS

CHOOSE BRAVECTO

PEACE OF MIND knowing your dog is protected for 3 months against ticks and fleas with just one dose of Bravecto, fewer treatments to remember, less to forget

A TREAT YOUR PET WILL LOVE A tasty oral chew that your dog will love, making it easy and convenient to give. No mess to administer, no liquids to spill or transfer.

WORKS FAST AND REALLY LASTS Bravecto provides effective control of fleas within 8 hours of administration and effective control of ticks within 12 hours and this control continue for full 3 months.

WORRY LESS, LOVE MORE Bravecto can be used in pups from 8 weeks of age weighing greater than 2kg, it is also safe for use in breeding, pregnant and lactating dogs.

PRESENTATION

Bravecto chewable tablets	Fluralaner (mg)
for small dogs (>4.5 – 10 kg)	250
for medium-sized dogs (>10 – 20 kg)	500
for large dogs (>20 – 40 kg)	1000
for very large dogs (>40 – 56 kg)	1400



The Fact of Life

*When your time is good,
your mistakes r taken as a joke..*

*But when ur time is bad,
even ur jokes r noticed as mistakes...*

Do You Drink Enough Water?
@starathletes



Your weight	Daily rate
9 kg	1 glass
18 kg	2 glasses
27 kg	3 glasses
36 kg	4 glasses
45 kg	5 glasses
54 kg	6 glasses
63 kg	7 glasses
72 kg	8 glasses
81 kg	9 glasses
90 kg	10 glasses
99 kg	11 glasses
108 kg	12 glasses
117 kg	13 glasses
126 kg	14 glasses
135 kg	15 glasses

GIGOLOS TEARY EYE STORY CHERRY EYE WITH ENTROPION

Introduction

Cherry eye is a common ophthalmic malady of dogs and rarely of cats in which eversion / prolapse of third eyelid gland does occur. The prolapsed third eyelid makes it vulnerable to the outer environment. Breeds especially Pekingese, Neapolitan Mastiff, Cocker Spaniel, Beagle, Bulldog and Basset Hound are more prone to this syndrome. The disease could occur in any age but most common in young ones i.e. puppies. This can occur in 2-3 years of age and may be unilateral or bilateral. Third eyelid is important in protection of eyes as well as production of tears. The eversion of nictitating gland is written off as glandular hyperplasia, hypertrophy, nictitating gland adenoma, protrusion of gland or cherry eye. The main cause of prolapse is weakening of supportive ligament that fixes the gland. The present manuscript is an attempt to report a cherry eye disease in dog probably due to entropion in a Basset.

Case

A 3 years old male dog, basset hound, named Gigolo was presented to Viegas Pet Clinic, Margao with a complaint of pinkish lump like structure protruding out at the base of left eye from the medial canthus. This condition was long standing and the patient was in great stress due to severe irritation and lacrimation.

Physical examination was normal with vitals within normal range. There was unsuccessful attempts to repair the cherry condition previous.

A thorough ophthalmic examination revealed presence of entropion along with prolapse of nictitance gland. Presence of entropion was put as a reason for cherry eye condition due to constant irritation.

The treatment modality with surgical correction of both the conditions was suggested.

Dog was put on anti inflammatory and antibiotic drops as preoperative preparation.

Cherry eye condition was corrected with modified Morgan pocket technique and entropion was repaired using modified Hotz-Celsius procedure.

Discussion

Third eyelid covers the medial canthus of the eye, consists of T-shaped flap like cartilage and tear gland, both are helpful in protection of eye. Prolapsed gland appeared as dark pink to reddish mass and misdiagnosed as a tumour and treated like a tumor in which gland was excised out, but this resulted in dryness of the eye because nictitating gland is one of the tear producing glands that keeps the eye moist. The main complication after its removal was kerato-conjunctivitis sicca (KCS). Third eyelid gland produces 30% of the total tears which are important for the intactness of eyelid, eyeball surface and conjunctiva. This prolapse happens because of the loss of tensile strength of the peri-orbital supporting ligament that anchors the gland to the peri-orbit.

Excision of gland is an old method and not recommended now-a-days because it leads to 'dry eye'. This causes further complications. Regarding second option cosmetically correction of prolapsed gland is the most recommended method in which 'tucking' technique is usually used. A modified Morgan pocket technique was used to correct the condition. The technique involved removal of a wedge of conjunctiva from medial surface of the nictitating gland creating a pocket and suturing to tighten the gland and replace it back to the normal position using 5-0 vicry.

Correction of Entropion

Most failures / complications associated with surgery of the eyelids are the result of poor suture selection and poor suture placement. Correct suture selection and placement will ensure a favorable outcome and prevent self-trauma.

Magnification is essential to accurately repair and reposition adnexal tissue.

Pre-operative NSAIDS's will improve post-operative comfort and outcome.

Following adnexal surgery, warm, moist compress of the sutures, keeping them free of debris will greatly improve outcome.

The first point to remember is the eyelids have only one purpose, to serve the cornea. Entropion occurs when there is an in-turning of the eyelid resulting in corneal irritation and possible ulceration. Left untreated, it may result in corneal vascularization, pigmentation and fibrosis. While most veterinarians have no difficulty recognizing and diagnosing entropion, surgical correction is often less than satisfactory. It must be first recognized that most, if not all canine entropion is also associated with macroblepharon and a weak lateral canthus. Failure to correct these will result in a less than acceptable surgical outcome and possible the need for a repeat surgical procedure. In addition, many surgeons fail to perform a modified Hotz-Celsus procedure in the correct location. Finally, incorrect suture selection may be associated with irritation, blepharitis and self-trauma.



In general, the normal canine eyelid when stretched will measure 23-36 mm medial to lateral in length. Prior to entropion repair, the eyelid length should be measured using a caliper. Many entropic eyelids will measure >35 mm prior to shortening. Following the lateral canthoplasty, a modified Hotz-Celsus procedure is performed with the initial incision parallel to an 2mm from the eyelid margin. Closure of both the lateral canthoplasty and the modified Hotz-Celsus procedure is performed using 5-0 monofilament, non-absorbable suture. These techniques will address the majority of canine entropion. For more severe entropion, as seen in the Shar-Pei and Chow Chow it may be necessary to resort to more aggressive procedures such as a brow-sling or stellate rhytidectomy.



Conclusion

In the case Gogole we used modified Morgan technique to repair cherry eye and a modified Hotz-Celsus procedure gave satisfactory results. The dog made uneventful recovery.

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FEEDING OF HIGH YIELDING BUFFALOES-AN OVERVIEW

Researches have been conducted on feeding of high yielding buffaloes using a wide range of feed ingredients and by way of attempting various combinations of feeding stuffs. Replacing 100% clover or a part of concentrate with whole corn silage with yeast culture supplementation significantly ($P < 0.05$) increased the milk yield of dairy buffaloes (Hanafy et al., 2009). High yielding buffaloes fed a ration having 60:40 (concentrate to roughage ratio) resulted in significant ($P < 0.05$) increase in milk yield, 7% FCM yield, protein, lactose and SNF% (Gaafar et al., 2009). Cotton stalks could be used as roughage source for formulating complete diets for buffaloes (Nagalakshmi and Narasimha Reddy, 2011).

On- farm trial on supplementation of bypass/ protected fat in buffaloes (Parnerkar et al., 2010) resulted in increased milk yield and fat percentage. Supplementation of protected fat (@ 2.5% of DM intake) and protected protein (formaldehyde treated cakes) during early lactation improved the milk production and its persistency (Shelke et al., 2012). The supplementation of bypass fat with and without rumen protected choline chloride significantly increased ($P < 0.05$) milk yield and milk fat in Jaffrabadi buffaloes, whereas, feeding of commercial product containing bypass fat and protein enriched with carbohydrate, chelated chromium and probiotic (100g/animal/day) improved milk yield and milk composition in graded Murra buffaloes (Garg et al., 2012; Dhullipala et al., 2013). Feeding of calcium salts of fatty acids (protected fat) and formaldehyde cakes (protected protein) to lactating buffaloes significantly ($P < 0.05$) increased the milk yield as well as quality of milk without affecting general health (Shelke and Thakur, 2011). Feeding of different Undegradable Dietary Protein (UDP) levels and planes of nutrition significantly increases ($P < 0.05$) average daily milk yield and milk composition in buffaloes (Nisa et al., 2008).

Supplementation of high sodium bicarbonate diet (feed additives) significantly ($P < 0.05$) increased DM intake, water intake, milk yield and fat percentage in early lactating Nilli Ravi buffaloes (Sarwar et al., 2007). Early lactating buffaloes fed +33 DCAD (Dietary Cation Anion Concentration) showed significantly ($P < 0.05$) increased DM intake, acid base balance, milk yield and fat percentage during summer months (Shahazad et al., 2008). Supplementation of Bovine Somatotrophic Hormone (bST) with high energy density diet significantly ($P < 0.05$) increased the milk yield with better feed efficiency in buffaloes (Batth et al., 2012). Replacing cottonseed cake with sunflower meal (18:25) improved milk yield and milk composition in lactating Nilli Ravi buffaloes. Also feeding of crushed flaxseed diet significantly ($P < 0.05$) increased milk yield, composition and milk fat percentage (Jabbar et al., 2009; Abd ElAziz et al., 2012) in buffaloes.

Supplementation of bypass protein (200g/animal/day) with and without bio promoters i.e. yeast culture (10g/animal/day) significantly ($P < 0.05$) increases milk yield and milk composition of lactating Murra buffaloes, similarly, inclusion of *Saccharomyces cerevisiae* during early lactation in buffaloes improved milk yield and its components and also reduced the somatic cell count (Akbar et al., 1999; Gaafar et al., 2009). Supplementation of fibrolytic enzymes (8000 U cellulase and 200000 U xylanase) significantly ($P < 0.05$) increased milk yield, 7% FCM, and yield of all milk components in buffaloes (Gaafar et al., 2010; Chandra Shekar et al., 2010).

Traditional feeding schedule followed for high yielding buffaloes in their home tract, their limitations and suggested corrections on scientific lines have been worked out by Central Research Institute on Buffalo (CIRB), Hissar (Lall et al 1995a and b; Lall et al 1999).

The NDDDB has developed Ration Balancing Programme (RBP) which is comprised of a feed data library and various "Nutrition masters". To create the feed data library, a wide range of feed ingredients such as green and dry forages, tree leaves, grains, oil cakes and agro industrial by-products were collected from different agro- ecological zones of the country and analysed for chemical composition. Simultaneously, existing national and international feeding standards for nutrient requirement of growing, lactating and pregnant animals were used to create various "Nutritional masters" of nutrient requirements (Kearl, 1982; NRC, 2001). In India; more reliable data is available on individual animals than on farm systems. The RBP has been implemented using individual animal profiles and hence data generated based on individual animals. Through various implementing agencies with adequate infrastructure and manpower (addressed as End Implementing Agencies; EIAs) NDDDB has initiated multistate implementation of the RBP on a large scale across the country. Ration balancing programme has the potential to increase milk production and reduce the cost of milk production and also methane emission (Garg et al., 2009 and 2013).

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Happy Birthday

Dr.Santosh Vaman Desai	01 February	Dr. Hari Narain Singh	08 February
Dr.Salvador Vaz	02 February	Dr.Avinash Vithal Nirmale	13 February
Dr.Laximan Navso Sawant	02 February	Dr.Anuradha Anant Naik	14 February
Dr.Neysa Grace Diniz	05 February	Dr.Rohidas Naik	26 February
Dr.Desiderio Menezes	06 February	Dr.Sherwin Sapeco	26 February
Dr.Farah Maria De Souza	06 February		

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