

“Faculty of Veterinary Science, Szent Istvan University”

Department of Animal Hygiene, Herd-health and Veterinary Ethology

**“Calf Management and its Consequences”**

by

Aine Reilly

Supervisor: Dr. Jurkovich Viktor  
Department of Animal Hygiene,  
Herd Health and Veterinary Ethology

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## **Introduction**

Calf diseases have a massive impact on the economic value of cattle operations, in this work I took the most important factors affecting the above statement. The overall goal of my work was to support the theory that management in calf and cattle farming is one of the most important determining factors regarding the viability of the farms in question. For that reason I collected my data and compared my results from previous data on six Irish Farms. I did this by setting up questionnaires for all six farmers and visiting the farms personally. The farms I choose to collect my farm were dairy farms with a mixed herd number. Ireland has a high standard of dairy farming so I decided this would be the type of farms I would base my findings on. I also decided to choose farms with a mix in herd numbers starting with small family run farming moving to the larger scaled farm units. In doing so I could compare the difference the size of the farm and the number of animals has on the calf health and the overall profit on the farms. By doing this I was able to compare the results of each farm from one another and determine if my results supported theories of the importance of calf management having a major impact on farm units.

In this work emphasis were placed on the calf rearing and the importance of management from calve to adult life. From my findings it was easy to see that the better the farm management the lesser the farmers loss. As farming like many professions is a business where losses need to be minimised and profit maximised. In order to achieve this farm management with the regards to calves plays a vital role. For that reason I have chosen to discuss each part in the life of the calve starting off with the importance of management during periparturient period, calving management at parturition, care of the newborn, colostrums management ,nutrition and weaning. Management of the most important disease were also analysed, including navel infections, diarrhoea, respiratory disease, lameness and all health problems farmers found themselves faced with. The aim of this work is to high light the problem and make to particular emphasis on the preventive measures as this in whole will minimise the losses suffered by the farmers.

In the second part of my work I move to the management of diarrhoeic diseases and pneumonia diseases in pre-weaned calves. After I collected my data from six farms varying in size throughout Ireland results proved conclusive that diarrhoea and pneumonias are the most important calf disease on farms. Other problems were detected but with fewer losses so I could include that the following such diseases were of less importance on Irish farms. Problems such as navel infections, lameness, arthritis, wounds, colic, claw trouble, bones, muscle or tendon, skin and heart problems.

After establishing the main disease problems Irish farmers are faced with it was important to look at the management regarding housing and ventilation systems how differences in types can contribute to disease in calves on farms.

## **2. Literature review**

The question of calf health management from birth to weaning and preventive measures is of utmost importance. When considering this wide scale topic it is vital to consider both pre- and periparturient management factors that influence the calf's health.

Calf related diseases have a major impact on the economic viability of cattle operations; this is due to the direct costs of calf mortality and any treatment or long term effects on performance (Lorenz et al., 2011 a,b,c). Calf health has been prioritised as one of the most important animal health issues facing many farmers in many different countries. The Irish livestock industry is no different regarding this topic with high importance (Lorenz et al., 2011 a,b,c). Irish farmers work continuously with the regard to produce superior healthy animals in order to maximise the profit margin and minimise annual losses.

### **2.1. Preparturient management factors**

Perinatal mortality is a problem in all breeds and types of farm animals but in particular in Holstein-Friesian-dominated dairy farms in Ireland and the across the world (Mee, 2008). Alterations made in - preparturient management to improve calf viability and health is best achieved by the presence of simple protocols which contain the correct strategies to be followed at the herd level and the correct procedures to be carried out at the individual animal level (Boersema et al., 2010). It has also been proven that decisions taken earlier on these production farms can influence calf health and viability. Important decisions such as choice of sire and sire breed, use of sexed semen, age and weight at service in heifers, vaccination of the dam and nutrient intake in early pregnancy.

#### **2.1.1. Nutritional management in the last trimester**

In the last trimester of pregnancy the importance and presence of energy and protein should be provided. However there must be a constant understanding and awareness on the farmer's part of the risk of overfeeding in dairy heifers. By complying this knowledge the farmers can prevent additional problems on their farm such as foetal oversize, alterations in the birth canal which then can lead to dystocia (Mee, 2008).

Another important factor to consider is the body condition score (BCS) in heifers and cows prior to calving. Target BCS of 3-3.5 on the scale of 1-5 should be the main protocol. Results prove that there are huge benefits to be found when the best body condition score is maintained on the cows and heifers prior to calving. Beneficial effects are on the length of parturition and the occurrence of perinatal mortality (Chassagne et al., 1999). However, cows suffering from an excess BCS may be carrying twins and should therefore be dried off early, fed to maintain body condition and monitored for obstetrical management.

### **2.1.2 Maternity facilities**

The design and standards of the cow and heifer housing can have a significant effect on calving outcomes for this reason it is important to discuss the management of the dam during parturition.

The principal function of a maternity unit is to establish as closely as possible natural calving conditions. To provoke natural calving conditions for intensively managed dairy cows they should be moved to maternity accommodation prior to the onset of calving though studies comparing this with moving once calving has commenced. Moving pregnant dairy cows and heifers later in the calving process when the placenta or fetal hooves are visible can reduce the odds of perinatal mortality compared to moving them earlier when mucus only is visible (Carrier et al., 2006).

### **2.1.3. Calving supervision**

Excellent calving supervision standards are a vital component which careful attention should be maintained at all times. This involves both the farmers and assistants being present during stage two of calving or to make the decision to call for veterinary assistance when required. It is important to maintain the natural conditions as much as possible so education on to know when to intervene or not. The day and time of calving is best predicted from the altered behaviour of the animal. Increased frequency of rising and lying down, pawing the ground with the forelimbs and urinating can be seen. The drop of the pelvic ligament to the relaxed form too is informative (Wehrend et al., 2006). Lack of supervision can lead to perinatal death and can be predisposing to the new born calves failing to receive the passive transfer of colostral immunoglobulin's via the vital colostrums with reference to (Besser et al., 1990). The importance of good calving supervision is highlighted in many reports.

Intervention tend to be recommended if the second stage of calving exceeds the time lapse of 2 hours (Gundelach et al., 2009). Pharmacological substances, such as clenbuterol, have been used successfully to both postpone night calving's and manage dystocia, but due to strike EU laws are not available in all countries.

#### **2.1.4. Obstetrical technique**

Training of farm staff with protocols for various obstetrical procedures and problems should be part of a modern veterinary practitioners duty, this knowledge should be passed on to farm staff so that assistance can be applied without needing veterinary intervention at all times (Mee, 2007).

#### **2.1.5. Care of the newborn calf to prevent poor viability and ill-health**

The emergency action and medicine concept of the 'golden hour' can be applied to at-risk new-born calves. This term refers to the known principle of a fast intervention that will prevent subsequent problems from following. High risk calves can be identified (1) before birth by the predicting the likelihood of a dystocia; (2) during birth by the examination of extra-large forelimbs, a swollen tongue, bluish muzzle and gums; or (3) after birth by respiratory alterations such as apnoea or dyspnoea, any signs of decumbency, musculature deviations such as flaccid muscles, and the importance of the suck reflexes. The farms which apply such measures and examinations during calving will prove to have fewer problems in the long run and less expense. A detailed physical assessment, application of resuscitation when necessary, umbilical antiseptics usage and vital colostrums feeding all play a considerable role in the overall correct management on modern day farm (Sorge et al., 2009).

#### **2.1.6. Assessment of newborn calf vitality**

The vigour of the new-born calf can be assessed immediately after calving by the farmer and the corresponding staff this can be done easily by monitoring the individual calve; carrying out the following procedures will help the early diagnostics and relevant treatment (Houwing et al., 1990).

1. Responsiveness to external stimuli, (movement, noise)
- 2 Muscle tone, ( rigid or flaccid)



3 Sucking reflex, observation of the calve looking for the teat of the dame

4 Time to head lift and time to first standing.

By following these simple steps and combining them with indicators in a calf vigour score stated by Sorge et al. (2009) time will not be wasted in the critical periods of the calves first few hours of life and care will be immediate.

#### **2.1.7. Calf resuscitation**

Immediately after birth, calves suffering from asphyxia or when personnel within the farm management suspects fluid in the airways the following procedure should be carried out,

- (1) Stimulation, by pouring cold water over the head and or in one of the calves' ears.
- (2) Suspending the calve upside-down, (by hind limbs) for several minutes.
- (3) Once a patent airway has been established, the breathing calve should be then placed in sternal recumbence (Uystepuyst et al., 2002). Sternal recumbency or suspension by the hind legs immediately after delivery improves respiratory and metabolic adaptation to extra uterine life in newborn calves delivered by caesarean section.

Mechanical ventilation should only be implemented in cases which do not respond to these first aid measures as mentioned above. While the clinical benefits of some pharmacological stimulants in new-born calves are also good. Many farmers at this stage have a tendency to call for extra veterinary advice or assistance. The use of drugs such as doxapram have recently been shown to be beneficial in cases of fetal asphyxia (Bleul et al., 2010). Other methods are available like Buffer solutions containing sodium bicarbonate have safely been used recently to improve the acid-base status in calves suffering from perinatal acidosis, according to Bleul et al. (2007), however when talking to farmers there is a lack of knowledge and full understanding, farmers are aware of the risk of inducing acidosis when using buffer type solutions but remain to use such substances. In order for these measures to be used correctly confidence and experience in these techniques is needed. Oxygen therapy for calf resuscitation is possible, even though not widely practised on commercial dairy farms. A positive effect of this measure on perinatal survival has only been proven (Bleul et al., 2008).

### **2.1.8 Umbilical care**

Prevention of umbilical or 'navel ill' is based on good maternity pen hygiene as stated by Gorden and Plummer (2010).

- (1) Reducing the length of time the new born calf spends in unhygienic calving pens.
- (2) Ensure the adequate and early intake of a high quality colostrum
- (3) The use of a navel antiseptic component.

In a recent review of navel care in new born calves (Mee et al., 2008). Concluded that “producers should avoid possibly harmful cord application procedures and concentrate on maternity pen hygiene and calf immunity”.

### **2.1.9. Colostrum management**

Due to the structure and type of the bovine placenta, the new-born calf is born without protective immunoglobulin's (Ig) and therefore is totally dependent on the successful passive transfer of maternal Ig from colostrum. This transfer is needed to occur within the first few hours of the calves life for the success of the immunoglobulin's transfer. According to Godden (2008) and Boyd (1972) who carried out multiple studies revealing results that failure of passive transfer ( IgG < 10 g/L [Mc Guirk 2008]) markedly increases morbidity and mortality in dairy calves (Meylan et al., 1996; McGuirk and Collins, 2004; Mee, 2008; Mee et al., 2008). As well as the vital immunoglobulin's, colostrum provides a variety of other important compounds such as cytokines and growth factors as well as this the colostrum is extremely rich and of superior nutritional value when compared with whole milk (McGuirk, 2008). In general, it can be said that adequate passive transfer is dependent on the quality of colostrum received by the calf from the dame and the calf's ability to absorb the adequate volume of the Ig.

The number of lactating animals, the breed of the cow and length of the non-lactating period influence the volume and Ig concentration of colostrum in dairy cows, if the non-lactation time is less than three weeks. Mean colostrum IgG concentrations of 68.5 g/L in Holstein cows were recently reported, whereby 32% of cows had poor colostrum quality (< 50 g/L) if milked within one hour after calving (Muller et al., 1981). This result was of interest to the second farm as data I received showed that their animals are milked straight after calving the farm management follow their farm protocol. Colostrum IgG concentration decreases by 3.7% during each subsequent hour

post calving; therefore, time of first milking is the most crucial factor regarding colostrum quality that the producer can influence as stated by Biemann et al. (2010).

When the calf is born the ability to absorb IgG starts to decline steadily after four to six hours and ceases after 24 hours from birth, for this reason it is of outmost importance that the calves receive the colostrum within this time frame. Lack of a experience may result on the calf missing the vital colostrum. If this is to happen the calf will be at a higher risk of infection uptake and their defence system will be impaired (Stott et al., 1979). Therefore, the earlier a calf is fed/suckles after birth, the greater the level of Ig absorption. Continuous feeding of smaller amounts of milk is recommended throughout the first two weeks of life has been associated with reduced diarrhoea in dairy calves (Berge et al., 2009).

Bacterial contamination of colostrum occurs frequently on many dairies, with two associated concerns; a risk of transfer of infection and decreased absorption of IgG in the intestines. Total bacterial count should not exceed 100,000 colony forming units (cfu)/mL and faecal coliforms should be below 10,000 cfu/mL in accordance to work retrieved by (McGuirk, 2008; Collins, 2004). In practice, these goals can be achieved by means of hygienic harvesting, avoidance of bacterial contamination, as well as immediate refrigeration or freezing of surplus colostrum (McGuirk, 2008; Collins, 2004). Routine pasteurisation methods is recommended this is the same procedure as carried out on the whole milk, however by carrying out this procedure one can cause a reduction in IgG concentrations (Meylan et al., 1996).

Colostrum replacement products are commercially available for use if maternal colostrum is not available or for any reason cannot be used. Studies have showing that although calves that are fed colostrum replacement have a relatively good immune system development they are at a higher risk of disease than those animals that receive the natural colostrums (Godden et al; 2003). “The use of colostrum replacers act as a substitute however they are poor in preventing neonatal morbidity and mortality compared with feeding the natural colostrums” Studies evaluating the efficacy of commercial colostrum carried out by Foster and Smith (2009) concluding that “simply examining the mass of IgG provided by the colostrum replacer is not an adequate measure or predictor of product efficacy”.

Frozen colostrum can be stored at -18 to -25°C for at least a year without changing its quality. Slow thawing at temperatures roughly just below 50°C does not affect colostrum quality, while temperatures above 50°C will cause proteins within the colostrums that are rich in immunoglobulin's, to decay (Davis and Drackley 1998).

#### **2.1.10. Further nutrition and weaning of the dairy calf**

Traditionally, across Irish farms calves have been fed natural milk or milk replacer to an amount of 10% of the calf's body weight per day (Jasper and Weary, 2002).

This level of nutrition received by restricted feeding allows only for maintenance requirements and minimal weight gain. Restricted feeding was introduced to encourage calves to eat concentrates as early as possible in doing this farmers can reduce the costs and the overall need to purchase additional expensive liquid feeds. After the calves initial time in life, usually after the first 3 weeks of life, starter concentrate intake increases and the calves start to grow very rapidly getting stronger and healthier as a result (Jasper and Weary, 2002).

An important factor which is independent of the feeding system, concentrates and water should be provided to calves at all times to enhance development of ruminal digestion. The amount of milk fed can then be reduced to 10% of BW at 3 weeks of age without any known negative impact (Khan et al, 2006). It is important that the consumption of concentrates is ensured as this enables the development of ruminal epithelium. The ruminal epithelium is necessary for the calf to digest solid feed.

As we can see there is a wide scope of preventive measures that are fundamental and very important to optimal calf health during the period from birth to weaning. An emphasis on prevention is a critical point, when preventive measures are carried out as routine procedure this has a limiting effect on disease occurrence. Any procedure that prevents the need for subsequent intervention, particularly with the management of diseases of the gastrointestinal such as diarrhoea and respiratory systems such as pneumonia are always a positive in modern day Irish farm. Preventive measures from birth to weaning are the start of an important and disease prevention regime which will continue throughout the calve life right through to adult hood.

## **2.2. Important calf diseases**

Diseases with regards to early life of the calf have a significant impact on the economic viability and value of cattle operations across all of Ireland the reason for this is due to the direct expense of calf losses and treatment and the long term effects on performance of the farms (Donovan et al, 1998). Calf health was prioritised as one of the most important animal health issues facing the Irish livestock industry in a recent expert studies conducted on behalf of Animal Health Ireland (More et al, 2010).

An on-going part of Animal health Ireland work, a group of experts (agricultural advisers and veterinary practitioners) had been asked to provide result based advice on calf health and disease management to Irish farmers. The main aim of these two groups of experts was to identify gaps in knowledge in farm units; they provided vital information to farm management to improve and to ensure the continuous modern advancement in Irish Farming. This was evident in the farms I visited, although there was differences in the farm units I visited, it was very evident weather new or old excellent knowledge is widespread in Irish farms. This is without doubt thanks to the on-going work provided by the Animal health Ireland organisation.

### **2.2.1. Neonatal calf diarrhoea**

Neonatal calf diarrhoea is recognised not only in Ireland but worldwide as one of the biggest challenges for both the beef and dairy industries. For that reason I recognised the importance of getting this information from the farms I visited in order to get an understanding of how this effects the modern day Irish farmers. As well as it proving to have a massive impact on farms in Ireland, roughly one third of US dairy cow and calf owners agree that it has an economic impact on their operations and it has constantly accounted for more than 50% of un-weaned dairy deaths (USDA 2007).

For the management of the individual diarrhoeic calf, the knowledge of the infectious agents that are involved is of little value. (Fagan et al.,1995). If specific preventive measures are considered, faecal samples from untreated calves early in the course of clinical disease can be submitted for laboratory analyses. However farmers are not willing to take on the extra expense involved in further laboratory analyses. Not only will this procedure be an additional cost on the farm unit as a whole but care must be taken, with the interpretation of results, since the enter pathogens most commonly

implicated in calf diarrhoea outbreaks can also be found in faecal samples from healthy calves and in calves from farms without diarrhoea problem, leaving results difficult to interoperate (Fagan et al., 1995).

Diarrhoea is generally the most common cause of morbidity and mortality in pre-weaned calves. A range of measures are critical to disease prevention, including colostrum management and subsequent nutrition (Lorenz, 2004). Adequate and continued milk feeding, hygiene and disinfectant regimes are each important in the successful management of neonatal calf diarrhoea. Vaccines for neonatal calf diarrhoea are available, however, efficacy of reports is very variable and data on the overall economic benefit for the farm management are lacking and for that reason is not a common route in which farm units choose to take.

### **2.2.2. Respiratory disorders**

As we establish the main goals for the prevention of calf diseases, another important factor came to attention, housing and ventilation management on Irish farm units. These two factors contribute to the cause and elevation of outbreaks of pneumonia in weaned and young dairy calves. There is a very distinct difference in the epidemiology of pneumonia and diarrhoea however both are important contributing to the main infectious calf disease.

Pneumonia in pre-weaned calves is a multi-factorial disease involving a well-known group of viruses, bacteria's and environmental risk factors. Most commonly are the list which follows, Viruses and bacteria's respectively.

Viruses:

- 1 bovine herpesvirus 1 (BoHV1);
- 2 bovine respiratory syncytial virus (BRSV);
- 3 parainfluenza 3 virus (PI3);

Bacteria:

- 1 Mycoplasma bovis
- 2 Pasteurella multocida,
- 3 Mannheimia haemolytica
- 4 Histophilus somni,

As well as these pathogens themselves causing primary disease they also can present themselves as a secondary form often when the calves are immune suppressed with

the pathogen that causes Bovine viral diarrhoea virus (BVDV), as stated by Saif (2010) in recent years.

### **2.2.3. Housing systems**

When calves are born they have functioning thermoregulatory mechanisms. Therefore, healthy calves are readily able to deal with outdoor temperatures as long as they receive adequate amounts of energy and are provided with a dry, well-bedded and draft-free shelter (Davis and Drackley, 1998). When there is a lower critical body temperature this will mean that additional energy is needed for the animal's heat production. According to Webster (1984) in the first two weeks of life the temperature of the calves is between the ranges of 10-15°C. As the calves increase in age there will be a steady decline in the critical body temperature roughly to 6-10°C. Although the animals have reached a lower critical temperature they become highly dependent on air speed. In the ideal situation the calves requires a clean, dry well ventilated living space. A crucial factor in maintaining the calves wellbeing is supplying a high quality of bedding material, this is very important to minimise the amount of heat loss via conduction (Webster, 1984). The best type of bedding that is most commonly used on Irish farms is deep straw bedding. It has proven to be superior to other bedding material in both its efficacy as an insulator and its high 'nesting score. According to Lago et al. (2006) this presents itself with the criteria needed for the preventive effect against calf respiratory disease in naturally ventilated calf barns.

Many reports have been carried out on the overall impact of calves housed together in groups, including both indoors and outside. Such reports carried out by Jorgenson et al. (1970) recorded the overall calf health including morbidity and fatal mortality on individual calves and the number of calves affected on farm units. A number of other authors have reported higher morbidity and mortality among group-housed pre-weaned dairy calves compared to individual housing (Svensson et al. 2006).

In contrast, two surveys report no difference in mortality between calves in group housing or individual housing (Kaske, 2005). These surveys and reports published show that it is not just in Ireland that suffers from calve losses other European and non-European countries to suffer losses. Such results show variation making it

difficult to pinpoint the main cause for calve morbidity and mortality on Irish and other farm units. However, some of the above authors discuss the possibility that superior disease detection in individual housing could account for this finding. Furthermore it was found that mortality appeared to be highest in large calf groups , for example calves in small groups no greater than seven tended to have a lower disease incidence compared to larger groups of calve i.e. > 20 where disease was much more common (Losinger et al., 1997). The prevalence of both diarrhoea and respiratory disease was more than twice as high among calves in mixed age groups compared to housing calves of a similar age together in groups (Gulliksen et al., 2009a,b). Studies in Ireland carried out by Earley et al (2004) revealed a higher incidence of respiratory disease mostly pneumonia but a lower incidence of diarrhoea had been identified when calves were kept indoors in groups compared to calves kept outdoors in groups.

#### **2.2.4. Ventilation**

Inadequate ventilation of calf barns increases the risk of disease due to a build up of high levels of humidity, noxious gases, dust and bacterial content.

Calf barns and sheds do tend to have high levels of humidity, noxious gases, dust and bacterial content but insufficient care with ventilation management will greatly increase this already existing factor as stated by Woolums et al. (2009). When there is inadequate ventilation ammonia levels of less than 10 ppm are recommended. However, in some cases concentrations of 5 ppm were too seen to lead to adverse effects on the respiratory system in young animals. When there is an accumulation of faeces and urine this will enhances the concentration on ammonia. This is important knowledge for farmers as they need to understand the effect of ammonia and must be prepared to take appropriate measure to reduce increasing levels. Advice and recommendations from Woolums et al.(2009) placed emphasises on the importance and need for regular cleaning and provision of dry bedding, together with adequate ventilation.



### **2.2.5. Recognition of pneumonia and its importance**

Cases of calf pneumonia may not be detected by the farmer and their farm management unfortunately they are most likely to go misdiagnosed or completely missed, as Sivula et al. (1996) have shown that keeper diagnosis is only 56% sensitive but 100% specific. As it is a difficult task to recognise pneumonia it is important that farm management are educated in early recognition of calf pneumonia. Such signs include elevated respiratory rate, fever, serous nasal discharge and at the most mild depression or in appetite. Since early treatment is the most important factor that prevents treatment failure, recognition at this stage would be preferable. Farmers should check temperatures of suspecting animals being aware of the threshold temperatures make early treatment best. The thresholds of 40-40.3°C cattle and 39.7°C for calves have been suggested by Woolums et al. (2009). If measurement of the body temperature is not practical, early recognition and the success of treatment relies on good observational skills of the farmer and farm management. Farmer are well educated but it is up to their own time and skill to make early diagnosis and make treatment as successful as possible.

Pneumonia is a significant cause of morbidity and mortality in calves, both during the pre-weaning period and shortly following weaning. A range of events are linked with increased disease risk, including weaning management, housing systems and ventilation and effective preventive measures have been demonstrated. The management of pneumonia in calves is reliant on a sound understanding of aetiology and of relevant risk factors and of effective approaches to diagnosis and treatment. It is up to the farmer and his farm unit to recognise risk factors on their farm and act.

### **3. Material and methods**

#### **3.1. Farms and animals**

Six Irish dairy cattle farm was visited in 2011 to measure the circumstances related to the health of calves. The data of farms are detailed in the appendix.

#### **3.2. Questions to be answered**

A farm questionnaire (see appendix) was made to detect the existing problems of calves health.

I started off by determining the importance of correct management during the preparturient period. By reading different articles it came to my attention that along with nutrition playing a vital role in this period of time another important factor was the cleanliness of the animals. I constructed a scale common to ones previously used to determine the body condition score of the animals. The scale was from one to five (Mulvany, 1977) I then looked at the significance of the presence or absence of maternity pen on each farm. As well as the farmers filling in the questionnaire I visited the farm to get a general impression of the condition of the keeping of the cows or heifers prior to calving. I choose diarrhoea as this is a common problem faced by Irish farmers regarding the health of the new calves.

From the preparturient period I moved to the calving/parturient period with particular references to the supervision before and during calving. I discovered that those farms that have established calving protocols had the easiest calving season and the less veterinary intervention needed. I received the information from the farmers and by doing so could say that the farms with best knowledge and experienced work staff were superior in this area.

The next part of my discussion was the care of the new born calf. Again it was evident that the farms with good protocols included the care of the new born calve in the routine procedure. The after care of the calf ranging from resuscitation if necessary to umbilical care varied form farm to farm so I included these result further in my discussion. I also included tables of differences in feeding methods artificial verses natural feeding and again the results were varying.

After looking at the main reasons and preventive measure established on the six farms I went on to look at the con sequential diseases with particular reference to the neonatal diarrhoea. Again interesting result came to the fore. As the main aim of the work is to access the calf management it was here the importance of different types of bedding was compared. How different types can hinder the calves health.

As well as neonatal diarrhoea being a major problem too is pneumonia in calves. With regards to pneumonia it is vital to speak of ventilation as this plays a contributing factor to the presence or absence to pneumonia.

## 4. Results and discussion

### 4.1. Nutritional management in the last trimester

Every dairy producer has cattle that are too fat or too thin for their stage of lactation. Failure to recognize these cows and take action costs dearly for disease treatments, losses in milk production, and decreased fertility. Body condition is a reflection of the body fat reserves carried by the animal. Cows should be scored both by looking at and handling the backbone, loin and rump areas. I carried out the assessment on the body condition by pressing my fingertips against the backbone and hip bone. Condition scores range from 1, a very thin cow with no fat reserves, to 5, a severely over conditioned cow. Ideal condition scores fall in the range of 3.0-3.5.

As the importance of body condition score is relevant in many aspects and management of farms I included a table of results found on farms I retrieved my data (Table 1).

Table 1, Average body condition scores of the cows being close to calving

Name of farm	Average BCS scoring (1-5)
Brady	3.4
Mc Kenna	3.3
Smyth	3.5
Reilly	3.5
Anderson	3.2
Harrison	3.3

### 4.2. Maternity facilities

Maternity units and facilities can have a significantly impact on the calves health, Michanek and Venton (1993) Dairy calves born in maternity pens are less likely to develop diarrhoea than those born in non-maternity facilities (loose housing) according to Curtis et al. (2005). Data I collected from my farm visits further proves this theory. (Table 2)

Table 2, Keeping system and the presence of diarrhoea in maternity units.

Farm Name	Maternity pens	Non-maternity pens	Diarrhea presence %
Brady	+	-	11.4
Mc Kenna	+	-	11.2
Smyth	-	+	28
Reilly	+	-	11.6
Anderson	-	+	16.6
Harrison	-	+	6.i

From the above table we can see the results support the evidence that those animals placed in maternity units decrease the chances of diarrhoea effecting calves post parturition.

The results suggest that it is less detrimental to move animals which have already commenced calving (stage two) than it is to move animals which are about to start calving (stage one). With regards farms one Brady farm and farm two Mc Kenna cows are moved immediately to maternity units at stage one of parturition. On farm three there are no maternity pens used farmer allows cow are heifer to continue with parturition without any interference. On farm four this is a new establishment and therefore the cows or heifers can be mover in stages one or two of parturition depending on situation. Farms five and six have no maternity units and disease is of varying results. From my data collected it is difficult to see major differences between moving cows in stage one verses stage two of parturition with regards differences in increased levels of calve diarrhoea. However what does appear clear is that there is a decrease in diarrhoea cases on the farms which have a written calving protocol and that use separate maternity units.

Individual vs. group maternity pens have been associated with increased calf plasma immunoglobulin concentration received via vital colostrums and as a result there is a reduced risk of enteric and respiratory disease in most cases. Although these results are supported in my data collected from Irish farms it cannot be said that this is the case in all farm management systems with reference to studies carried out (Svensson et al., 2006a). Irrespective of the type of maternity facility, early removal of the calf

(before standing) has been recommended to reduce calf hood morbidity and mortality on dairy farms in the USA (Mc Guirk et al, 2004)

### **4.3. Calving supervision**

We can see that the knowledge written in 2.1.2 is widely used in all the six farms I collected data from, farms which have a successful protocol have the less problems during and post parturition. Farmers on such farms were educated and take their work serious. This is best seen on farms one and two the detailed protocols which are obeyed at all-time means they have the least losses and most efficient farms.

Ireland is the member of EU so therefore, due to the strict regulations in all the farms I collected data there was no use of substances such as clenbuterol to postpone night calving and manage dystocia. Other methods in technology have been used successfully such as calving alarms have been developed to alert farmers to the time of calving such as biosensors that monitor postural behaviour, intravaginal or reticular temperature, vaginal mucus electrical resistance, myometrium contractions or tail elevation. All these are new more advanced systems on farms due to commercial availability and expense the use of such devices is a new phenomena not practiced on the farms I collected data from.

### **4.4. Obstetrical technique**

From table three, see below results are as follows, almost a third of calving's are assisted, and less than three percent of these need extra veterinary assistance. This is good for the modern day farmers as to reduce overall veterinary expenditure. Farmers with good obstetrical technique can prevent iatrogenic traumatic lesions, a major cause of perinatal mortality, particularly now that mechanical traction is commonly employed at calving. For example, recent research has shown that alternate limb traction should be applied until both elbows have entered the pelvis and simultaneous traction should then be applied to reduce the risk of trauma to the calf (Becker et al., 2010).

Table 3, Assistance at birth

Farm Name	Farm staff Assistance at birth	Veterinary intervention
Brady	35	4
Mc Kenna	31	3
Smyth	27	3
Reilly	23	2
Anderson	22	2
Harrison	12	1

#### 4.5. Assessment of newborn calf vitality

A calf should normally lift its head, attain sternal decumbency and attempt to stand and to stand spontaneously, on average, 3, 5, 20 and 60-90 minutes after birth, respectively (Becker et al., 2006; Schuijt and Taverne, 1994).

This information enables the farmer and staff to act fast on problematic calves and reduce the need for extra veterinary assistance. This is seen very clearly in the data collected, see below from farm one. A detailed protocol is applied and the farmer and his staff care is of utmost importance to the viability of their calves.

#### 4.6. Umbilical care

Very interestingly I discovered from the data collected from all six farms there was not one case of naval ill or joint ill. All farms although carry out different hygienic protocols do disinfect their farm and use antiseptic solutions on the calves' navels. On farm one the farm management use a tincture that contains 7% iodine and alcohol to disinfect the navel this is carried out immediately post calving. On farm two the management also use a protocol which is as follows with regard to navel treatment and care, Navel are treated immediately, for this a navel spray containing 7% iodine is used. In herds with serious navel-ill problems, none of which were the farms I obtained my data, producers should improve maternity pen hygiene, institute immediate and repeated cord dipping with chlorhexidine according to the work and data obtained from Waltner-Toews et al. (1986a, b). Removal of the calf immediately

after birth to a clean calf pen, hand-feeding colostrum and regular checking for navel ill appears to be the best protocol carried out by successful farm managements.

#### **4.7. Colostrum management**

On all farms I collected data from the farms that followed out the strict calving protocol or general feeding colostrum all farmers were satisfied that their new born calves did receive the vital colostrum within the first few hours of life. In general adequate passive transfer is subject of the quality of the colostrums the calf's ability to absorb Ig and the volume ingested (Tomkins et al., 1991).

Another method that came to my attention is that the farmers could test the quality of the colostrum, the benefit of testing on farms with a commercially available hydrometers is controversial and not fully successful. I asked each farmer did they use any method of testing colostrum and the result was that they believed they had a good protocol in place and colostrum testing was not necessary as it would be another expense and overall the reply was that this was not needed. On further investigations Chigerwe et al. (2008a) showed, that the hydrometer did give good results only if the scales were adjusted for the specific device used in each case. It was proven that the "More reliable results could be achieved using refractometry" (Bielmann et al., 2010). I forward this information to the farm management on the farms i visited, farms 1 and 3 seemed interested in the refractometry and were open to trying this on the farms as a routine procedure.

It is the current recommendation that a normal sized dairy calve in Ireland the most common breed on farms is the Holstein-Friesian should be given either 3 L of good quality colostrum within 2 h of birth by oesophageal tube or at least 3 L within 4 h and a total of 4 L within 12 h from birth by nipple feeding (Chigerwe et al., 2008b). The amount of colostrum that calves drink voluntarily does not change within the first 4 h after birth. Feeding colostrum by stomach tube ensures successful passive transfer of a high volume is received. However, if smaller volumes are given and the amount of immunoglobins administered is marginal the calf should be fed by a nipple bottle, since the absorption of immunoglobulins in this situation is superior to that of stomach tubed calves. Another disadvantage of the stomach tubing is that if carried out incorrectly could mean inducing asphyxia and fluid accumulation in the air ways. For that reason it is very important that the person carrying out this procedure is trained correctly and aware of the damaged that can be induced. On asking the



management from the farms I received data from the all said they knew how to carry out this procedure correctly however only one of the farms received the correct training to do so.

#### **4.8. Future nutrition and weaning of the dairy calf**

It has been known for a long time that calves can grow a lot faster if they are supplied with more nutrients (Woodward 1923; Marshall and Smith. 1970). However, worldwide interest in early calf nutrition has only recently been heightened, based on research from Diaz et al.(2001) and Jasper and Weary (2002) to mention but a few. Calves suckling their dam basically can be said to be feeding ad libitum ingest about 20% of body weight (BW) per day and reach up to 1 kg of daily weight gain (Flower and Weary, 2001; Marshall and Smith, 1970). This is of interest to the farms in which I collected data from the table below differences can be seen (Table 4).

Table 4. Method of feeding calves

Farm Name	Method of feeding
Brady	Natural for 48hours- Artificially reared
Mc Kenna	Artificially Reared
Smyth	Natural reared with Dame
Reilly	Natural for 2hours- Artificially reared
Anderson	Artificially reared
Harrison	Naturally- Artificially

Although each farm has a different feeding regimes on my visits to the farms I could not see major differences in body condition scores, therefore I cannot definitely support the theory that calves fed ad labium verses artificially have a greater daily weight gain.

Most commonly the procedure carried out in Ireland is that, dairy calves are provided with liquid feed twice daily. No difference in calf performance between once or twice daily feeding was found when calves were raised on restricted feeding systems (Galton and Brakel, 1976; Gleeson et al., 2008; Gleeson et al., 2007), respectively.

However, once-daily feeding will present problems if calves are fed per normal or as close to naturally as possible in the first weeks of life, the change will prove problematic. On Irish dairy farms Gleeson et al. (2008) discovered no significant advantages in labour input either during feeding or in overall calf care between once-daily, twice-a-day or ad libitum feeding systems. When I posed these questions to the farmers I received data similar results were evident.

#### **4.9. Neonatal calf diarrhoea**

In Ireland, diarrhoea is the most common cause of death in calves from birth to one month of age submitted for post mortem examination (Regional Veterinary Laboratories - Surveillance Report 2009). This is evident when we look at the results shown in Table 1, where we can see the percentage diarrhoea cases in the farms I took data. Diarrhoea is showing in high percentage on each farm compared to other diseases. The preferred method and the one with best results is to maintain a disease prevention not only regarding diarrhoea but also all other diseases that may appear to be problematic. In the ideal situation calf disease is kept as low as possible but unfortunately due to the intensity of which Irish farming has had to reach to maintain high consumer demand this is not always possible in calf rearing systems. Appropriate calf management, once an outbreak of diarrhoea has developed, it is critical to avoid any additional losses of animal welfare and farmer distress.

As I continued my study deeper it emerged that the following were the most common types of diarrhoea effecting neonates, according to research carried out by Foster and Smith (2009).

- 1 Enterotoxigenic Escherichia coli
- 2 Cryptosporidium parvum,
- 3 Rotavirus
- 4 Coronavirus

On the farms where I collected my data information on the percentage of calf diarrhoea was available however, not the actual break down of the exact pathogen causing each individual infection. “These infectious agents can also be found in faecal samples from healthy calves and in calves from farms without diarrhoea problem” (Reynolds et al. 1986; Silverlås et al., 2010). When I informed the farmers of faecal sampling

and what to look for they all were of the same thought of this being too time consuming and labour costly. The main management factors with impact on the resistance of the infectious pressure can be lowered through general hygiene in the areas of calving, feeding, housing and in general calf handling.

In Table 5. below I included the different types of hygiene protocols with regards to pre-calving pens and bedding cleanliness on each farm I received data, also see relevant farm data and questionnaire.

Table 5. Type and cleanliness of bedding in the calving pen

Name Farm	Pre-calving bedding used?	Cleanliness of bedding scale 1-5	Type of bedding in calving pen	Hygiene protocol between calving.
Brady	Yes	5	Straw thick bed	Yes
Mc Kenna	Yes	4	Straw moderate thickness	Yes
Smyth	Yes	4	Straw moderate thickness	Yes
Reilly	yes	5	Rubber mats	Yes
Anderson	yes	3	Straw mild thickness	Yes

The importance of cleanliness is vital on each farm, as we can see all farm units had a good system successfully in order. Another important factor to reduce the incidence of calf disease is the use of disinfectant agents. Although cleaning the area is vital without successful application of a disinfectant the risk of infectious pathogens entering farm units will be higher (Gorden and Plummer, 2010). Below I included a table of the different disinfectant agents used on all six of the farms I collected data from (Table 6).

Table 6. Disinfectants and cow cleanliness before and after calving

Farm Name	Disinfectant used in pre calving area?	Type of disinfectant agent used?	Cleanliness of cow before calving, scale (1-4)*	Cleanliness of cow after calving, scale (1-4)*
Brady	Yes	Quill ultra-dry powder	Total cows 114 Score 3	Total cows 114 Score 3.5
Mc Kenna	Yes	Quill ultra-dry powder	Total cows 110 Score 2	Total cows 110 Score 2
Smyth	Yes	Betadine spray	Total cows 100 Score 2.5	Total cows 100 Score 3
Reilly	Yes	Betidine/water solution	Total cows 89 Score 2	Total cows 89 Score 2
Anderson	Yes	Powder form of chlorohexidine	Total cows 75 Score 3	Total cows 75 Score 3
Harrison	Yes	Iodine solution sprayed on bedding	Total cows 50 score 4	Total cows 50 score 4

\*Where 1 means clean and 4 means dirty (Wilkes et al., 2008)

On each the farms I was impressed by the cleanliness and continuous use of disinfectant agents. This will reduce infectious pathogens and limit the extra cost for treatment of sick animals.

As I mentioned before one of the most important infectious found on Irish farms is Enterotoxigenic E. coli. This pathogen usually only cause secretory diarrhoea in the first four days of life (Foster and Smith, 2009), for that reason it was important to note relevant hygiene and disinfectant protocols on farms I collected data from with regards to pre and post calving. As well as is Enterotoxigenic E. coli causing effect on farms the other common pathogens Cryptosporidium parvum, Rotavirus and coronavirus are involved in neonatal calf diarrhea. These pathogens cause damage to the intestinal mucosa resulting in both malabsorptive and secretory diarrhoea. When any of these pathogens enter the farm

unit they result in an overall extra cost on the farmer, one of which they ultimately try to avoid. They do so by setting good preventative measures in order and maintaining them.

#### **4.10. Respiratory diseases**

It is believed that individual housing of dairy calves regardless of being housed indoors or outdoors is generally linked to improving calf health. It has been established over some period of time that there is benefits to dairy calf health of outdoor housing in hutches. The major benefits are in the prevention of diarrhoea and respiratory disease (Davis and Drackley, 1998). “Hutches have been associated with lower morbidity and mortality in dairy calves” (Waltner-Toews et al., 1986a,b). No major differences difference between daily weight gain, presence of scours or pneumonia in the first two weeks of life was seen when comparing indoor and outdoor rearing in individual pens. This was only noted when these individual pens had not been used for calf rearing before or these pens had been entirely cleaned out and disinfected between use with reference to Jorgenson et al. (1970). Indoor versus outdoor, calf rearing at three weaning ages. This would mean in theory calves reared outdoors would present the best option for farmers. However, caring for calves in outdoor hutches can be uncomfortable in adverse weather conditions. Farming in Ireland although well-developed cannot depend on using outdoor calve hutches as weather is very changeable. Temperatures soar and drop from day to day due to the temperate climate. For that reason the best option for Irish farmers is to provide individually pens for calves indoors in barns with a natural ventilation this would lower the risk for respiratory disease (Lago et al., 2006). Farmers are however faced with European legislation which prohibits solid walls in individual calf pens and, while it allows calves to be kept individually for the first 8 weeks of life, it encourages group housing for animal welfare reasons (Council Directive 2008/119/EC) see below, type of housing for calves on the six farms I collected data (Table 7.)

Table 7. Housing of calves

Name farm	Kept system	No of calves with diarrhoea and or pneumonia
Bradys	Individual pens 6 weeks- group calves together in same shed	Diarrhoea : 10 Per 114 Pneumonia: 4
Mc Kenna	Individual pens 8 weeks – group calves together in 2 separate barns	Diarrhoea: 11 Per 102 Pneumonia:5
Smyth	Together indoors- outdoors in pasture weather dependent.	Diarrhoea: 28 Per 100 Pneumonia: 8
Reilly	Individual pens 3 weeks- grouped calves indoor in pens	Diarrhoea: 14 Per 83 Pneumonia: 5
Anderson	Individual in pens 4 weeks- outdoors weather dependent	Diarrhea:22 Per 73 Pneumonia: 3
Harrison	Individual separate pens 8 weeks- outdoors	Diarrhoea: 13 Per 47 Pneumonia: 5

As we can see from the above data, results vary making it difficult to say which system is best as the ideal keeping system of calves. If we look at results from Farm three and six Smyth and Harrison they are good examples of how the Irish weather affected their calf disease incidence. Both these farmers are small in size with little room for expanding, as this would mean losing ground that is needed for cow grazing. For that reason regardless of whether there animals are put outside. When I retrieved the farm data it had been a particularly bad year in Ireland regards weather. Temperatures were very low conditions were harsh. It can be assumed that these factors contributed to the high number of diarrhoea and pneumonia suffered by livestock on these farms. This is only a presumption but it supports suggestions previously made by Lago et al. (2006).

In summary, there have been a high number of studies and surveys carried out in Ireland and abroad dealing with different variations of methods of rearing calves. (Svensson et al., 2006a,b). These contain references to individual and group housing, as well as outdoor and indoor rearing, with varying and sometimes even contradicting results were found. Overall, one could say or presume that outdoor individual pens appear better than indoor housing, but individual housing in small groups appears better than keeping calves in large groups with regards to the overall calf health.

Natural ventilation is best achieved through wind which provides an important port of entry for fresh air. In all farms I visited the ventilation was well achieved via the type of housing system in place. Recommended spaces for in/out let air space have been stated by Bates and Anderson (1984) air outlets (ridge opening: 5 cm width for every 3 m width of the building) and inlets openings (at least half the space of ridge openings). Table 8. Shows the ventilation systems in place on the farms I visited.

Table 8. Ventilation in the barns.

Name of Farm	Ventilation source	% Pneumonia
Brady	Wall to roof gap on 2 of 4 walls of Barn-15cm	3.5 %
Mc Kenna	One wall had an adjustable level opening, opened at 6cm but in humid weather could be extended.	4.9 %
Smyth	All four walls had a gap of 12cm from roof to wall	8%
Reilly	From roof –wall there was a gap of 1.5 meters this was covered in vertical sheets of timber with a gap of 0.4 cm between each sheet of timber.	6%
Anderson	Roof had small slits in slates, building low ceiling	5.4%
Harrison	Roof small gaps in it with low ceiling	10.6%

If we refer to the data collected on the farms we can deduce that the farms with the better ventilation systems have indeed less problems with respiratory disease. With farms one and two Bradys and Mc Kenna respectively even though they have the larger number of calving's a year the ventilation is well established. They have developed barns that allow a constant flow of fresh air. Although these farms have good ventilation, problems may still arise in these naturally ventilated calf barns. This is usually experienced in cold and damp wintry conditions, when it can be impossible to keep relative humidity below the acceptable level of 85%, according to Webster (1984). Additionally, ventilation is often compromised by closing of air inlets in an attempt to prevent cold stress for the calves. If calves are housed in individual pens indoors, the barn climate often does not reflect the microclimate in the pens. This makes it difficult for farmers to access the actual ventilation in the barn as a total. Ventilation is impaired with an increase in number of calves and depending on the type of material used in building the barns."Ventilation is impaired with an increasing numbers of stock and the large amount of solid panels surrounding the calf (solid walls in the back or front of the pen, top covers), leading to an increase in airborne microbes" (Lago A et al, 2006).

As we can see from the data attached that I received from each farm dairy calf rearing management and facilities vary widely between farms. Therefore, each of the previously mentioned risk factors at calf and environment level has to be considered when faced with an outbreak of calf pneumonia. Additional factors identified to increase pneumonia risk in housed calves include shared airspace with older animals, overcrowding, and power-washing of calf facilities while calves are still present, (Gorden and Plummer, 2010).



## 5. Summary

In this paper entitled “Calf Management and its Consequences”, I discussed different aspects of calf management primarily in Ireland. After completing this work I am in support of the theory that management in calf and cattle farming is one of the most important determining factors regarding the viability of the farms in question. I discussed each aspect in the life of the calve, initially I discussed the importance during the periparturient periods, then I moved to calving management at parturition, care of the newborn, colostrums management ,nutrition and weaning. Management of the most important disease were also analysed. The aim of this work is to high light the problem and make to particular emphasis on the preventive measures as this in whole will minimise the losses suffered by the farmers. Keeping this in mind I believe the most important factor within the calf management protocol is the availability of knowledge and rigors efforts in maintaining hygiene. I am of the opinion that that Irish farmers weather it is a small scale or a large scale operation try their best to maintain hygiene protocols. However a major problem these farmers are consequently faced with is the high cost and expenses needed to continue high standards of hygiene. Most farmers in Ireland are well educated in the field of calf management but more often than not the hygiene standards can be set aside by the impending costs and expenses.

Ireland is an agricultural based country where farming is vital to sustain our economy even more so in the current economic climate. Agriculture is one of the main employment sectors in Ireland and it can be said its contribution to the economy is vital. For this reason I think that more funds, financial and educational support should be made more accessible. The main foundations of correct calf management is correct hygiene when this is maintained and kept to the fore other secondary problems are minamilisd

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## 7. Appendix – The Farm Questionnaires

### 1 Farm Data

**Name of Farmer:** Brian Brady

Name of Farm : Tullybrian Dairy Farm

Herd Number:

**Type of Farm, diary or beef?** Dairy

#### **Keeping system:**

**A Cows Tied or loose in free stall boxes or individual boxes or small groups?** Loose in large sheds in winter outdoors on pasture in spring and summer

**B Calves:** Separated from cow post 48hours moved to large shed containing individual pens kept her for 6 weeks, then housed together in large well ventilated barn separated from other animals.

### 2 Management

**Is it a family farm?** Yes it is a family run operation

**Does the farm have employees?** Yes the farmer employs three full time staff

**Who assists in calving? Farmer, employee or vet?** Mostly the Farmer and the employees, vets are called when needed.

**Are there maternity pens are non-maternity pens present:** Yes

**Written protocol for calving? Does the farm have one?** Yes they have a well-established protocol.

1 Calves and heifers are moved to individual large well bedded calving pens when there are close to calving at stage one of parturition. They remain there unless the do not calve with in 24hrs

2 When the cow are heifer is showing signs of parturition ( walking , tail up , distressed) they are closely monitored every 30 minutes. For this the farmer or employee stay in the barn.

3 the whole calving process should be run smoothly. For first time heifers the time of parturition is expected to last longer .

4 Very important that the person overseeing the parturition ensure the calve is coming in the correct presentation. (both front legs and head together pointing down)

5 when assistance is needed the following steps must be carried through fully to ensure a clean and a hygienic environment for both the cow and the new born Calf.

- A) the assistant fills a bucket of lukewarm water in to which they must add Nolvason. The concentration is two or three ounces per gallon water. This is considered a good amount for sufficient disinfection. The chains and calving jack are to be washed in the disinfectant.
- B) The chains are carefully placed around the calves legs, depending on the position of the calve will determine the assistance next move. The level of experience is important as to know when to intervene and when the vet needs to be called.

6 It is very important to know what you are doing. If unsure always call for assistance. Vets number attached. In general the parturition should be as natural as possible one should not interfere if not needed. In the case of a heifer where the calves front feet are presented the assistant can then check to ensure the cervix is well dilated. In this case the assistant can pull the calf out using own strength or aided by a calving jack.

6 It is very important to know what you are doing. If unsure always call for assistance. Vets number attached

7 The care of the new born calf: As the calf is being delivered make sure it is breathing. Ensure the airways are opened and free from fluid. Using bedding rub the calf vigorously and ensure all amniotic fluid cleared from the nostril and mouth.

**Are there maternity pens are non-maternity pens present: Yes**

**Written protocol for calving? Does the farm have one?** Yes they have a well-established protocol.

1 Calves and heifers are moved to individual large well bedded calving pens when there are close to calving at stage one of parturition. They remain there unless they do not calve within 24hrs

2 When the cow or heifer is showing signs of parturition (walking, tail up, distressed) they are closely monitored every 30 minutes. For this the farmer or employee stay in the barn.

3 the whole calving process should be run smoothly. For first time heifers the time of parturition is expected to last longer.

4 Very important that the person over viewing the parturition ensure the calve is coming in the correct presentation. (Both front legs and head together pointing down)

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B) The chains are carefully placed around the calves legs, depending on the position of the calve will determine the assistance next move. The level of experience is important as to know when to intervene and when the vet needs to be called.

6 It is very important to know what you are doing. If unsure always call for assistance. Vets number attached. In general the parturition should be as natural as possible one should not interfere if not needed. In the case of a heifer where the calves front feet are presented the assistant can then check to ensure the cervix is well dilated. In this case the assistant can pull the calf out using own strength or aided by a calving jack.

6 It is very important to know what you are doing. If unsure always call for assistance. Vets number attached

7 The care of the new born calf: As the calf is being delivered make sure it is breathing. Ensure the airways are opened and free from fluid. Using bedding rub the calf vigorously and ensure all amniotic fluid cleared from the nostril and mouth.

8 Dip the navel immediately after calving. The tincture used on this farm contains 7% iodine and alcohol to disinfect the navel.

9 do not leave the calving area until the cow is up on her feet and cleaning the calf this should take no longer than 5 to 10 minutes

10 Observe calf and cow to ensure nursing and colostrums uptake. The Calf records should be taken, on this farm this includes the sex of the calf, the date and time the calf was born and the dams details. A record is also taken with regards to ease of calving judged by the following scale.

0 Abortion

1 No assistance

2 Minor assistance

3 Pull with chain (easy one person)

4 Pull with chain (difficult more than one person)

5 C- section

11 Colostrum uptake, regular checks to ensure the calf has consumed the colostrums

12 On receiving the natural cows colostrums the cow and the calve remain together for 48hours. After this the calf is moved to separate calf pens.

**Are calves separated from mother?** If so When? Yes the calves are separated from their mothers 48hrs after birth to allow time for the calf to uptake the natural colostrums.

**When and how do the calves receive their fist colostrums?** Within the first 2 hours post parturition natural sucking from all four quarters of the cow's udder. If natural sucking does not occur intervention is needed. Colostrum is available on the farm at all times in the frozen form the colostrums can be taken from the cow provided it is then ginen to calf within 30 minutes, Frozen colostrums is then given to the calf at 40.5 degrees. Usually in two feeds with an eight hour interval.

**How much Litres does the calve drink of colostrums at first?** Between the time of 2 to 6 hours the calf need to drink up on four litres colostrum

3 Hygiene around calving

**First impression of the farm?** This farm was spotless, on arrival constant cleaning was carried out to my departure. Any visit I paid to the farm there was some form of cleaning or disinfecting being carried out routinely.

**Extent to which the farm is tidy and cleaned?** As well as the sheds, stables, calving area and milking parlour being very clean so to was the outside of the building and the surrounding outdoor pens and paddocks.

**First impression of the barn ?** The sheds were very large and with a high rough, half way up the walls was painted black from floor up and the other half to the roof was painted black. From the top of the wall to the roof there was a gap of 15 cm providing a cool well ventilated environment. On the floor there were automatic scrappers which were programmed to run every 8 hours. The floor was concrete.

**Feeding trough and drinkers,** the feed silage provided in the middle passage of the shed. The floor was moderately clean. The water drinkers were located at the back and sides of the sheds.

**Humidity?** Moderate

**Cobwebs,** none to very few present.

**Manure:** the floor was made of concrete slats so when the cows feaced and urinated it falls below to a manure tank. The shed also Has electronics scrappers running every eight hours constantly keeping the floor of the passage way free from manure build up.

**Impression of Manure?** There was very little manure on the floor and the walls were newly painted so very clean to look at.

**Equipment**, wheel- borrows. Pitch forks were clean and well out of range to the animals.

**Impression of the waiting area?** The cattle prior to moving to the milking parlour wait in the loading bay, this area was moderately clean. I noticed the ground was very rough the concrete was very old there was cracks and crevices. There was some manure mostly fresh, however as soon as the bay was emptied the area was cleaned using a power washer.

**Floor Presence of dirt?** Yes some but all fresh manure

**Feeding path?** Remains of feed was small, the colour and quality of the silage was good.

**Floor/slats?** The floor was a combination of slats and solid concrete. The manure was scrapped away every six hours.

**Bedding material?** Bedding was with straw. It was stored in a shed adjacent to the barn with a northerly opened face to the building the straw was exposed to the weather. The straw was in large round bails. The shed was cold and airy.

**Water troughs** ?Placed along the back and side of the shed they were clean however there was some not working and had not been replaced, The water was clear and free from sediment.

**Climate in barn?** The Barn was a well ventilated area not too cold and free from odour other than that of the feed and some manure from underlying manure pit.

**Illumination in barn?** Lighting was very good all areas of the large barn were very well visible.

**Ventilation** ; was good with fresh air influx from wind via the 60 cm gap between wall and roof. The gap was only on two of the four walls.

Preventive measures:

**1 farm clothing**, clean overalls were worn by all employees. Wellington boots stayed on site on the farm. There was an employee's wash room and clean garments were available all the time.

**2 hygiene regime**, on arriving to the farm visitors and workers must be free from illness. All footwear is dipped in a disinfectant bath on entry and exit of the farm.

**3 manure disposal and built in scrapers.** All barns were equipped with electronic scrapers running every 12 hours. Manure was stored in an outdoor slurry pit. From the shed where there was concrete slats, manure and urine flowed to the slurry pit.

**4 Roof**, the roof of the barn was insulated with a mesh cover.

**5 type of roof and ventilation.** The roof was made of metal galvanised sheets and ventilation was via the gap between the roof and the wall. This gap was present in two of the four walls. Air could flow in and out constantly keeping the area well ventilated and free from dust.

**6 Wind breaking screens** present or absent. There was no wind breaking screens

-

### Hygiene check list

When i questioned the farmer I also scored a large number of hygiene aspects in the stables,sheds and surrounding areas. On a scale from 1 to 5, where

- 1 was clean
- 2 was mild dirty
- 3 was moderate dirty
- 4 was very dirty
- 5 was extremely dirty

### **The areas inspected were then grouped into categories:**

- 1 Milking unit, 1
  - 2 Bulk tank room, 2
  - 3 Cattle housing,cubicles, floors. 2
  - 4 Area of calving barn or stables 2
  - 5 New born calve pens 1
  - 6 Also the number of cows and calves as well as their hygiene score based on a scale of 1 to four.
- Three zones of the body were evaluated they were as follows,
- 1 Udder
  - 2 lower leg
  - 3 Upper leg and flank

**What kind of bedding is used before calving?** Clean straw was in each calving pen for the cow before calving. This was a thick, clean and warm bedding type.

**How clean is the bedding before, during and after cleaning?** Before was very clean, during parturition was moderate due to manure and discharge from the cow during calving, After parturition new straw was added if needed but the unit was not cleaned to the calf and the cow had been removed.

**What type of bedding is used in the calving area?** Calving pens had a thick bed of straw. Cleaned out after each calving and replaced with new straw. The calving pen was disinfected after each calving.

**What kind of hygiene protocol is used in between different calving's?** After each calving the pen is totally emptied from all straw and power washed. The area is disinfected and let air dry.

**Do the farmers disinfect the calving area pre-calving, at calving and post calving?** Pre calving

**What kind of disinfectant is used?** Quill ultra dry powder is used when is it applied? Applied on calving area before calving. After the calving pen has been power washed powder disinfectant is applied.

**How clean were the cows before calving (scored 1-4)** out of 114 calving the average cow score for this farm was 3.5

**How clean are the cows after calving : 3**

4 Around time of calving

Number of normal births? (per annum) 114

Number of which had assisted births? (per annum) 35

Number of distocia? (per annum) 4

Number of retained placentas? (per annum) 8

Number of problems during involution ? (per annum) 2

Number of mastitis infections? (per annum) 4

Number of single calves born? 114

Number of twin calvings? 0

5 Calf diseases

Number of umbilical infections per annum? 0

How long after birth was the infection detected?

Number of arthritis (joint ill) per annum, 0

When was the joint ill detected? 0

Diarrhoea in calves? 10

Respiratory diseases? 2

Wounds , abscesses and flegmones? 3

Ingestion/colic? 0

Wounds caused by the interior? 2

Claw diseases? 0

Fractures of bones, muscle or tendon injury? 0

Lameness? (Scale 1 –4) 20

Eye infections? 0

Bloat? 3

Heart diseases? 0

Skin disorders?

## **2 Farm Data**

Name of Farmer: Noel Mckenna

Name of Farm : Mullnahinch Dairy Farm

**1.Type of Farm**, dairy or beef? Dairy

**Keeping system:** Tied or loose in free stall boxes or individual boxes or small groups?

**Cows:** Loose in large sheds in winter outdoors on pasture in spring and summer

**Claves:** Individual pens immediately for 8 weeks then housed together in barn.

## **2. Management**

**Is it a family farm?** No this is a company

**Does the farm have employees?** Yes the farmer employs 8 full time employees.

**Who assists in calving? Farmer, employee or vet?** Mostly the Farmer and the employees, vets are called when needed.

**Are there maternity pens are non-maternity pens present:** Yes

**Written protocol for calving? Does the farm have one?** Yes they have a calving as well as a calve rearing protocol.

1 Calves or heifers are moved to individual large calving pens when there are close to calving at stage one. Signs coming close to calving are as follows

- a) cows appear uneasy displaying irregular movements.
- b) The tail is loose and easy to move up and down due to ligaments becoming looser
- c) vulva becomes enlarged and flabby
- d) Distension of the teats and or the udder.

2 When the cow or heifer is showing signs of parturition, see above. They are closely monitored every 15 minutes.

4 Very important that the cow is observed and that the calve is coming in the correct presentation.

5 When assistance is needed the following steps are carried through out. With regards the decision making you must always call for assistance if in doubt. Warm water, towels and disinfectant should be used.

6. Vets number attached. Please call for assistance before making final decision on calling the vet. The calf birth is best naturally with no interference. Only help when is needed. I t is very important to know what you are doing. If unsure always call for assistance.

This farm had a calve rearing protocol.

- 1 Calf on delivery. Ensure it is breathing and the airways are opened. Any fluid in nasal and mouth are to be removed immediately. Ensure the calf is breathing on its own. If the calve is slow to respond water is put into its ear.
- 2 Calf is immediately removed from the cow or heifer to separate caving pens
- 3 Each pen must be thoroughly washed by power hosed before and between each calves entry.



- 4 Cows are then moved to pens.
- 5 While working with the new born calves all staff must be wearing latex gloves and clothes should be clean.
- 6 + born calve pens all workers must dip their feet in the disinfected water bath at the entrance.
- 7 Sick cows are immediately removed to sick bay and kept in an isolated area until well.
- 8 All bull calve are separated from heifers and will be taken to mart that week.
- 9 All calves must be identified and tagged immediately. On each use the calf tagger needs to be disinfected.
- 10 Calves receive their first colostrums within 6hours. The colostrums preferred is fresh straight from the milking of the cow. All calves must be fed twice a day for the first 7 days.
- 11 On day 10 or 12 of calving the calve receives vaccinations. Please ensure all calve receive their vaccinations
- 12 All calves are tagged, sex is noted details of the dam are recorded.

**Are calves separated from mother?** If so When? Yes the calves are separated from their mothers immediately and enter the calf pens.

**When and how do the calves receive their fist colostrums?** Within the first 6 hours post parturition natural colostrums is preferred this is obtained by milking the cow. Colostrums must be of a good standard. Clean and fresh.

**How much Litres does the calve drink of colostrums at first?** Between the time of 2 to 6 hours the calf need to drink up on four litres colostrums. The preferred method is via a bucket with a teat attached. Employees must be sure that the calf has taken up the important first colostrum

3 Hygiene around calving

**First impression of the farm?** This farm was spotless, by far the cleanest of all the farms I visited.

**Extent to which the farm is tidy and cleaned?** All buildings, surroundings and additional equipment were very clean.

**First impression of the barn?** The sheds were very large and with a high roof, half way up the walls was painted black from floor up and the other half to the roof was painted black. Out of the four walls in the barn one had removable cover this could be opened at closed as required. On the floor there were automatic scrappers which were programmed to run every 4 hours.

**Feeding trough and drinkers,** the feed silage provided in the middle passage of the shed. The floor was very clean. The water drinkers were located at the back of the sheds.

**Humidity?** Moderate

**Cobwebs?** None

**Manure:** the floor was made of concrete covered in rubber matting. The shed also has electronic scrapers running every four hours constantly keeping the floor of the passage way free from manure build up.

**Impression of Manure?** There was very little to no manure present on the floor and the walls.

**Equipment,** was very clean and well out of range to the animals.

**Impression of the waiting area?** The cattle prior to moving to the milking parlour wait in the loading bay, this area was very clean. The floor had rubber matting and the loading bay was covered by a roof. There was some manure all fresh, however as soon as the bay was emptied the area was cleaned using a power washer and brushes.

**Floor Presence of dirt?** Moderate

**Feeding path ?** Remains of feed were little to none. The colour and quality of the feed was excellent.

**Floor/Slats?** The floor was a combination of slats and solid concrete which was covered with rubber matting. The matting was 3cm deep black in colour and there were ridges in the matting for extra gripping. The manure was scrapped away every 4 hours.

**Bedding material?** No bedding was used just the presence of the rubber matting. The rubber mats are in sheets which interlock and can be disconnected at anytime removed and cleaned. The type of mats are known as “dura mats” they withstand the weight load and traffic of the dairy farm. Maintain a high quality and good shock absorbance minimizing lameness on the farm.

**Water troughs ?**Placed along the back shed they were very clean run on a timer if there is a power cut the farmer told me that there is a backup generator which starts immediately., The water was clear and free from sediment.

**Climate in barn?** The Barn was a well ventilated area not too cold and free from odour. One of the walls had a removable cover which can be opened and closed as needed.

**Illumination in barn?** Lighting was very good all areas of the large barn were very well visible. Again lighting is backed up by the support generator in the event of a power cut.

**Ventilation ;** was good no draft was present.

Preventive measures:

**1 farm clothing,** clean overalls were worn by all employees. Wellington boots stayed on site on the farm. Each morning a new set of cleaned garments were to be worn by all workers.

**2 hygiene regime,** On arriving to the farm visitors and workers must be free from illness. You will not be permitted entry unless you are healthy. Footwear and garments

are provided by the farm and must be removed placed in the wash room prior exiting the farm.

**3 manure disposal and built in scrapers?** All barns were equipped with electronic scrapers running every 4 hours. Manure was scrapped off the floors and taken outside where it was stored in a large slurry pit located close to the sheds.

**4 Roof,** the roof was of a high standard slatted and had insulating mesh.

**5 Type of roof and ventilation.** The roof was made of slates and ventilation was via the removable cover on one of the walls.

**6 Wind breaking screens, present or absent.** There was no wind breaking screens

Hygiene check list

When I questioned the farmer I also scored a large number of hygiene aspects in the stables, sheds and surrounding areas. on a scale from 1 to 5, where 1 was clean

2 was mild dirty

3 was moderate dirty

4 was very dirty

5 was extremely dirty

The areas inspected were then grouped into categories:

1 milking unit, 1

2 bulk tank room, 1

3 Cattle housing, cubicles, floors. 1

4 Area of calving barn or stables 1

5 New born Calve pens 1

6 Also the number of cows and calves as well as their hygiene score based on a scale of 1 to four.

Three zones of the body were evaluated they were as follows,

1 Udder

2 lower leg

3 Upper leg and flank

**What kind of bedding is used before calving?** Clean straw was in each calving pen for the cow before calving. This was a thick, clean and warm bedding type. The farmer prefers a very thick bed of straw to minimise injury during the parturition. Below the straw there was the rubber matting.

**How clean is the bedding before, during and after calving?** Before was very clean, during parturition was moderate due to manure and discharge from the cow during calving, after parturition all straw was removed and the area was power washed, followed by disinfectant being added. A new bed of straw is placed in the pen so that is ready and waiting for next cow.

**What type of bedding is used in the calving area?** Calving pens had a thick bed of straw. Cleaned out after each calving and replaced with new straw. The calving pen was emptied, power washed and disinfected after each calving.

**What kind of hygiene protocol is used in between different calving's?** After each calving the pen is totally emptied from all straw and power washed. The area is disinfected. Once every two weeks the rubber matting is also removed power washed and disinfected then allowed to dry and placed back into the calving pen.

**Do the farmers disinfect the calving area pre-calving, at calving and post calving**  
? pre calving .What kind of disinfectant is used? Quill ultra dry powder is used when is it applied? Applied to calving area before calving. After the calving pen has been power washed this powder disinfectant is applied.

**How clean are the cows before calving (scored 1-4)** Out of 110 calving the average cow score for this farm was 2

**How clean are the cows after calving : 2**

4 Around time of calving

Number of normal births? (per annum) 102

Number of which where assisted births? (per annum) 31

Number of distocia? (per annum) 2

Number of retained placentas? (per annum) 10

Number of problems during involution ? (per annum) 1

Number of mastitis infections? (per annum) 5

Number of single calves born? 102

Number of twin calvings? 0

5 Calf diseases

Number of umbilical infections per annum? 1

How long after birth was the infection detected? 24hrs

Number of arthritis (joint ill) per annum, 0

When was the joint ill detected? o

Diarrhoea in calves? 11

Respiratory diseases? 1

Wounds , absesses and flegmones? 1

Ingestion/colic? 0

Wounds caused by the interior? 1

Claw diseases? 0

Fractures of bones, muscle or tendon injury? 0

Lameness? (Scale 1 –4) 5

Eye infections? 0

Bloat? 1

Heart diseases? 0

Skin disorders? 0

### **3 Farm Data**

Name of Farmer: Joesph Smyth

Name of Farm : Derrylea Dairy Farm

**1.Type of Farm**, dairy or beef? dairy

**Keeping system: Tied or loose in free stall boxes or individual boxes or small groups?** Loose in large sheds in winter outdoors on pasture in spring and summer

### **2. Management**

**Is it a family farm?** Yes it is a family run operation

**Does the farm have employees?** No all members of the family work on the farm

**Who assists in calving? Farmer, employee or vet?** Mostly the Farmer and his family, neighbours also help if needed and the vet is called for emergency situations

**Written protocol for calving? Does the farm have one?** No written protocol, the farmer and his family work with years of experience. The farmer is well educated about calving having over forty years of experience which he passes on to his children.

Are there maternity pens are non-maternity pens present: no

**Are calves separated from mother?** If so When? No the calves are not separated from their mothers immediately. The farmer separates the calf from the cow usually one week following parturition. However separation is carried out at the farmers digression when he feels the calf is strong enough to cope on its own separation will be carried out. There is no stricked rule on timing.

**When and how do the calves receive their fist colostrums?** Within the first 2 hours post parturition natural sucking from all four quarters of the cows udder. If natural sucking does not occur intervention is needed. Colostrum is available on the farm at all times in the frozen form the colostrums can be taken from the cow provided it is then given to calf within 30 minutes, Frozen colostrums is then given to the calf at 40.5 degrees. Usually in two feeds with an eight hour interval. The farmer spends a great deal of time with the new born calves ensuring they can suck from the cow naturally or artificially from a bucket containing fresh colostrums.

**How much Litres does the calve drink of colostrums at first?** Between the time of 2 to 6 hours the calf need to drink up on four litres colostrums. The farmer never gives up on the calf until at least 4 litres of colostrum have been consumed.

3 Hygiene around calving

**First impression of the farm?** This farm a little dirty, on arrival the lane driving to the farm had some manure. The farm environment was very friendly and easy going. Cleaning was not carried out vigorously.

**Extent to which the farm is tidy and cleaned?** As well as the sheds ,stables, calving area and milking parlour moderately clean. The outside of the building and the surrounding outdoor pens and paddocks were of moderate cleanliness.

**First impression of the barn ?** The sheds were very large and with a a low roof. The walls were unpainted. From the top of the were to the roof there was a gap of 20 cm providing a cool well ventilated environment. The gap between the wall and the roof was on all four walls. On the floor there were automatic scrappers which were programmed to run once every day, usually during the night. On observation of the scrappers there was two broken which still needed repairing

**Feeding trough and drinkers,** The feed was silage provided in the middle passage of the shed. The floor was not so clean, some old dry manure was stuck to the floor. The water drinkers were located at the back and sides of the sheds.

**Humidity?** Moderate

**Cobwebs,** there were a great deal of cobwebs hanging from the roof and the lights.

**Manure:** the floor was made of concrete slats so when the cows defecates and urinates it falls below to a manure tank. The shed also has electronic scrappers running every twelve hours. on a closer look at the scrappers I Were equipped with electronic scrappers running once every 24 hours. Manure was stored in an outdoor slurry pit. From the shed were there was concrete slats, manure could see that the blades were old and not all of them were in direct contact with the floor meaning that scrapping was not as efficient in some parts of the shed than others.

**Impression of Manure?** There was a moderate amount of manure on the floor. A mixture of old and new.

**Equipment,** wheel borrows, pitch forks were moderately clean and well out of range to the animals. Stored in a separate storage room of the side of the shed.

**Impression of the waiting area?** The cattle prior to moving to the milking parlour wait in the loading pen this area was dirty. No electric scrappers were here and the area was only cleaned once a week.

**Floor Presence of dirt?** Yes manure was on the floor a mixture of old and fresh manure.

**Feeding passage?** Remains of feed was small, the colour and quality of the silage was good. However the passage where the feed laid was not very clean a thick amount of dust was on the passage way.

**Floor/slats?** The floor was a combination of slats and solid concrete. the manure was scrapped away every twelve hours.

**Bedding material?** bedding was with straw. It was stored to the back of the shed separated from the cows by a partition. The straw was in small square bails. The shed was cold and slightly dusty.

**Water troughs?** Placed along the back and side of the shed they run automatically on observation two of them were leaking on the floor wetting the bedding also there was a scum dark in colour in some of the drinkers,

**Climate in barn?** The Barn was a well moderately ventilated area not too cold but it had a strong odour off manure.

**Illumination in barn?** Lighting was very good all areas of the large barn were very well visible.

**Ventilation?** was good with fresh air influx from the 12cm gap between the roof and top of wall of all four walls.

Preventive measures:

**1 farm clothing**, overalls and own clothes were worn by the farmer and his family. Wellington boots or steel toed boots were worn. There was no wash room on the farm site the family returned to and from the farm in the same clothes.

**2 hygiene regime**, On arriving to the farm visitors and workers must be free from illness. I was given some overalls to wear. There was a foot dip but it was dirty and had sediment in it.

**3 manure disposal and built in scrapers**. All barns and urine flowed to the slurry pit.

**4 Roof**, the roof of the barn was isolated with a mesh cover the building was very old and leaked rain water in some areas.

**5 Type of roof and ventilation**. The roof was made of galvanise sheets and ventilation was via a gap between the roof and the wall. This gap was present on all four walls. Air could flow in and out constantly keeping the area well ventilated and free from a build up of dust.

**6 Wind breaking screens, present or absent**. There was no wind breaking screens

Hygiene check list

When I questioned the farmer I also scored a large number of hygiene aspects in the stables, sheds and surrounding areas. on a scale from 1 to 5,

where 1 was clean

2 was mild dirty

3 was moderate dirty

4 was very dirty

5 was extremely dirty

The areas inspected were then grouped into categories:

1 milking unit, 3-4

2 bulk tank room, 3

3 Cattle housing, cubicles, floors. 3-4

4 Area of calving barn or stables 2

5 New born calve pens 1-2

6 Also the number of cows and calves as well as their hygiene score based on a scale of 1 to four.

Three zones of the body were evaluated they were as follows,

1 Udder

2 lower leg

3 Upper leg and flank

**What kind of bedding is used before calving?** Straw was in each calving pen for the cow before calving. This was a thick, clean and warm bedding type.

**How clean is the bedding before, during and after cleaning?** Before was very clean, during parturition was moderate due to manure and discharge from the cow during calving, After parturition new straw was added if needed but the unit was not cleaned to the calf and the cow had been removed.

**What type of bedding is used in the calving area?** Calving pens had a bed of straw. Cleaned out after each calving and replaced with new straw. The calving pen was disinfected after each calving. Using a spray type.

**What kind of hygiene protocol is used in between different calvings?** After each calving the pen is totally emptied from all straw and power washed. The area is disinfected and let air dry.

**Do the farmers disinfect the calving area pre-calving, at calving and post calving ?** pre calving. What kind of disinfectant is used? Betadine spray is used When is it applied? Applied to calving area before calving. After the calving pen ha been power washed this powder disinfectant is applied.

How clean are the cows before calving (scored 1-4) out of 100 calving the average cow score for this farm was 2.5

**How clean are the cows after calving :** 3

4 Around time of calving

Number of normal births? (per annum) 100

Number os assisted births? (per annum) 27

Number of disticia? (per annum) 2

Number of retained placentas? (per annum) 4

Number of problems during involution ? (per annum) 4

Number of mastitis infections? (per annum) 8

Number of single calves born? 100

Number of twin calvings? 0

5 Calf diseases

Number of umbilical infections per annum? 0

How long after birth was the infection detected?

Number of arthritis (joint ill) per annum, 0

When was the joint ill detected?

Diarrhoea in calves? 28

Respiratory diseases? 8

Wounds , abbesses and flegmones? 9



Ingestion/colic? 0  
Wounds caused by the interior? 8  
Claw diseases? 7  
Fractures of bones, muscle or tendon injury? 0  
Lameness? (Scale 1 –4) 17  
Eye infections? 0  
Bloat? 1  
Heart diseases? 0  
Skin disorders? 1

#### **4 Farm Data**

Name of Farmer: James Reilly

Name of Farm : Cornacassa Dairy Farm

**1.Type of Farm**, Dairy or beef? Dairy

Keeping system: Tied or loose in free stall boxes or individual boxes or small groups?

**Cows:** Tied in a large barn

**Calves** Individual pens for first three weeks then in larger pen in groups.

#### **2 Management**

**Is it a family farm?** No

**Does the farm have employees?** Yes the farmer employee's one part time staff

**Who assists in calving? Farmer, employee or vet?** Mostly the Farmer and the employees, vets are called when an emergency occurs.

**Written protocol for calving? Does the farm have one?** No the farm is a newish farm and has not established a calving protocol but are interested in establishing one.

**Are there maternity pens are non-maternity pens present:** yes , animals are moved to calving pen at the stage one or two of parturition.

**Are calves separated from mother?** If so When? Yes the calves are separated from their mothers immediately after birth to separate a separate calf unit. The calf unit is located near to the main barn.

**When and how do the calves receive their fist colostrums?** Within the first 2 hours post parturition, Colostrum is fresh. On calving the cow is straight away taken to a milking unit in the parturition shed were she is milked. This fresh milk reach in colostrums is to be given to calf within to one hour.

**How much Litres does the calve drink of colostrums at first?** Between the time of 2 to 6 hours the calf need to drink up on four litres colostrums.

3 Hygiene around calving

### **Component Criteria paid attention to**

**First impression of the farm?** This farm was spotless, on arrival constant cleaning was carried out. The farm only being in operation from 2007 was new and off a very high standard. The farmer explained how he received a grant to have the farm at this high standard all buildings and equipment were of the highest standard.

**Extent to which the farm is tidy and cleaned?** The farm was in a semicircular arrangement all building, out buildings, loading and waiting bays were very clean.

**First impression of the barn ?** The sheds were of medium size and with a high rough, half way up the walls was painted black from floor up and the other half to the roof was painted black. From the top of the wall to the roof there was a gap of 1.5 meters this was covered in vertical pieces of timber with a gap of 0.4 cm between each piece of timber.

On the floor there were automatic scrappers which were programmed to run every four hours. The floor was concrete and had a specialized non slip covering.

**Feeding trough and drinkers,** The feed was silage provided in the middle passage of the shed. in a container or drench lower than the floor level by about 2.5cm. The floor was very clean . The water drinkers were located at the back and sides of the sheds.

**Humidity?** Mild

**Cobwebs,** none were visible

**Manure:** the floor was made of concrete slats so when the cows feaced and urinated it falls below to a manure tank. The shed also has electronic scrappers running every four hours constantly keeping the floor of the passage way free from manure build up.

**Impression of Manure?** There was very little to no manure on the floor and the walls were newly painted so they were very clean.

**Equipment,** all equipment was spotless and stored in a separate shed.

**Impression of the waiting area?** The cattle prior to moving to the milking parlour enter in to a tunnel directly behind the parlour. They enter via one side of parlour and exit via a different side. Loading bay, the floor was covered in rubber matting and had a gripes in the matting. The farmer milked the cows twice a day and after each milking the parlour and tunnel were power washed.

**Floor Presence of dirt?** Slight amount of dirt

**Feeding path ?** there was a small remnant of feed

**Floor/slats ?** The floor was a combination of slats. Concrete and rubber mats

**Bedding material?** Bedding was not used, in each cubicle where the cow could lie down had its own individual rubber mat.

**Water troughs** ?Placed along the back of the shed they were very clean and all working. The water was clear and free from sediment.

**Climate in barn?** The Barn was a well ventilated area and free from odour .

**Illumination in barn?** Lighting was very good all areas of the large barn were very well visible.

**Ventilation** ; was good with fresh air influx .

Preventive measures:

**1 farm clothing**, clean overalls were worn by all employees. Wellington boots stayed on site on the farm. There was a wash room and clean garments were available all the time.

**2 hygiene regime**, On arriving to the farm visitors and workers must be free from illness. I was given boots and overall to wear.

**3 Manure disposal and built in scrapers** . All barns were equipped with electronic scrapers running every four hours. Manure was stored in an outdoor slurry pit with a cover on it. From the shed there were concrete slats, manure and urine flowed to the slurry pit. And made its way to the outdoor slurry pit.

**4 Isolated roof**, the roof of the barn was isolated with a mesh cover.

**5 type of roof and ventilation**. The roof was made of slated sheets ventilation was via the a gap between the roof and the wall. Covered by timber pieces with a gap between each adjacent one. Air could flow in and out constantly keeping the area well ventilated and free from dust.

**6 Wind breaking screens, present or absent**. There was no wind breaking screens

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Hygiene check list

When I questioned the farmer I also scored a large number of hygiene aspects in the stables, sheds and surrounding areas. on a scale from 1 to 5, where 1 was clean

2 was mild dirty

3 was moderate dirty

4 was very dirty

5 was extremely dirty

The areas inspected were then grouped into categories:

1 milking unit, 1

2 bulk tank room, 1

3 cattle housing, cubicles, floors. 1

4 Area of calving barn or stables 1

5 New born calve pens 1

6 Also the number of cows and calves as well as their hygiene score based on a scale of 1 to four.

Three zones of the body were evaluated they were as follows,

1 Udder

2 lower leg

3 Upper leg and flank

What kind of bedding is used before calving? There was no bedding used on this farm each calving pen had a rubber matt fitted.

How clean is the bedding before, during and after cleaning? The rubber mats were power washed before each calving and after each calving.

What type of bedding is used in the calving area? Calving pens had individual rubber mats specialized for shock absorption. Cleaned out after each calving via power washing and disinfection was added.

What kind of hygiene protocol is used in between different calving's? After each calving the pen is totally emptied from all manure and foetal discharge. It is then power washed. The area is disinfected and let air dry.

Do the farmers disinfect the calving area pre-calving, at calving and post calving ? pre calving. What kind of disinfectant is used? A betidine mixed in water solution was used.?

How clean are the cows before calving (scored 1-4) out of 89 calving the average cow score for this farm was 2

How clean are the cows after calving : 2

4 Around time of calving

Number of normal births? (per annum) 83

Number of assisted births? (per annum) 23

Number of disticia? (per annum) 2

Number of retained placentas? (per annum) 2

Number of problems during involution ? (per annum) 3

Number of mastitis infections? (per annum) 3

Number of single calves born? 83

Number of twin calvings? 0

5 Calf diseases

Number of umbilical infections per annum? 0

How long after birth was the infection detected?

Number of arthritis (joint ill) per annum, 0

When was the joint ill detected? 0

Diarrhea in calves? 14

Respiratory diseases? 5

Wounds , abscesses and flegmones? 2

Ingestion/colic? 0

Wounds caused by the interior? 1

Claw diseases? 0

Fractures of bones, muscle or tendon injury? 0

Lameness? (Scale 1 –4) 7

Eye infections? 0

Bloat? 3

Heart diseases? 0

Skin disorders? 0

## **5 Farm Data**

Name of Farmer: George Anderson

Name of Farm : Greendale farm

**Type of Farm**, dairy or beef? Dairy

**Keeping system: Tied or loose in freestall boxes or individual boxes or small groups? Cows:** loose in a large barn

Calves: Individual pens for four weeks outdoors weather dependent.

2 Management

**Is it a family farm?** yes

**Does the farm have employees?** No all work is done by the farmer

**Who assists in calving? Farmer, employee or vet?** Mainly the farmer, vets are called when an emergency occurs.

Written protocol for calving? Does the farm have one? No the farm is a of moderate scale with no protocol. .

Are there maternity pens are non-maternity pens present: no

**Are calves separated from mother?** If so When? No the calves are not separated immediately they are allowed remain with the cow until vital colostrums has been received they then move to group pens were milk replacer is given. After this the calves are moved out doors with straw dale shelters included in the fields. The large straw dales provided good shelter for the calves

**When and how do the calves receive their fist colostrums?** Within the first 2 hours post parturition ,Colostrum is freshly naturally sucked from the cows teats.the farmer is only satisfied when he is sur ethe calf has received the vital colostrum

**How much Litres does the calve drink of colostrums at first?** Beween the time of 2 to 6 hours the calf need to drink up on four litres colostrums. The farmer is happy with three litres.

3 Hygiene around calving

cattle prior to moving to the milking parlour enter in to a holding bay. This area had a roof coverage and was newly concreted so the floor was of a high quality. The farmer milked the cows twice a day and after each milking the parlour and loading bay were power washed after.

**Floor Presence of dirt?** moderate amount of dirt

**Feeding path ?** there was a small remnant of feed

**Floor/slats ?** The floor was a combination of concrete slats and concrete.

**Bedding material** ? bedding was used for this a thick non dusty straw bedding was first preference, in each cubicle where the cow could lie down there was a thick cover of straw..

**Water troughs?** Placed along the back of **First impression of the farm?** This farm was moderately clean consisting of old and new sheds. The farm was at the base of a hill providing good all year weather protection.

**Extent to which the farm is tidy and cleaned?** The farm was cleaned well the farmer explained that once a week he power washes the outside yard and adds disinfecting in the form of powder.

**First impression of the barn?** The sheds were of medium size and the roof was low, the roof had small holes all over it which aided ventilation. The floor was made up of solid concrete and concrete slats which manure and urine could fall to the underlying manure pit.

**Feeding trough and drinkers,** The feed was silage provided in the middle passage of the shed. The floor was moderately clean with manure remnants visible. The water drinkers were located at the sides of the sheds.

**Humidity?** mild

**Cobwebs,** yes there was a thick covering on cob webs seen on the roof.

**Manure:** the floor was made of concrete slats so when the cows feaced and urinated it falls below to a manure tank. The shed also has electronic scrappers running every twelve hours keeping the floor of the passage way free from manure build up.

**Impression of Manure?** There was some old and fresh manure on the floor and the walls.

**Equipment,** all equipment was moderately clean and stored in a separate shed.

**Impression of the waiting area?** The shed they were very clean and all working. The water was clear and free from sediment.

**Climate in barn?** The moderately ventilated area and had some manure odour.

**Illumination in barn?** Lighting was of moderate standard the strength of the lighting was slightly weak.

**Ventilation ;** was moderate, the shed was very warm and stuffy.

Preventive measures:

**1 farm clothing,** clean overalls were worn by the farmer. Wellington boots stayed on site on the farm. There was a wash room.

**2 hygiene regime,** On arriving to the farm visitors and workers must be free from illness. I was asked to dip my boots in the disinfectant bath provided on enter and exit of the farm.

**3 Manure disposal and built in scrapers .** All barns were equipped with electronic scrapers running every twelve hours. Manure was stored in an outdoor slurry pit with no cover on it. From the shed where there were concrete slats, manure and urine flowed to the slurry pit. And made its way to the outdoor slurry pit.

**4 Isolated roof,** the roof of the barn was isolated with a mesh cover.

**5 type of roof and ventilation.** Ventilation was moderate. The roof was made of slatted sheets ventilation was via small holes in the roof.

**6 Wind breaking screens, present or absent.** There were no wind breaking screens

Hygiene check list

When I questioned the farmer I also scored a large number of hygiene aspects in the stables, sheds and surrounding areas. on a scale from 1 to 5, where 1 was clean

2 was mild dirty

3 was moderate dirty

4 was very dirty

5 was extremely dirty

The areas inspected were then grouped into categories:

1 milking unit, 3

2 bulk tank room, 2

3 cattle housing, cubicles, floors. 2

4 Area of calving barn or stables 2

5 New born calve pens 2

6 Also the number of cows and calves as well as their hygiene score based on a scale of 1 to four.

Three zones of the body were evaluated they were as follows,

1 Udder

2 lower leg

3 Upper leg and flank

What kind of bedding is used before calving? A thick covering of straw was used in each of the calving pens

How clean is the bedding before, during and after cleaning? The straw was of moderate cleanliness.

What type of bedding is used in the calving area? Calving pens had a straw bedding of mild thickness.

What kind of hygiene protocol is used in between different calvings? After each calving the farmer sprinkled powdered disinfectant on the straw,

Do the farmers disinfect the calving area pre-calving, at calving and post calving ? pre calving. What kind of disinfectant is used? A powder form was sprinkled all over the bedding.

How clean are the cows before calving (scored 1-4) out of 75 calving the average cow score for this farm was 3

How clean are the cows after calving : 3

4 Around time of calving

Number of normal births? (per annum) 73

Number of assisted births? (per annum) 22  
Number of disticia? (per annum) 1  
Number of retained placentas? (per annum) 3  
Number of problems during involution ? (per annum) 2  
Number of mastitis infections? (per annum) 2  
Number of single calves born? 73  
Number of twin calvings? 0  
5 Calf diseases  
Number of umbilical infections per annum? 1  
How long after birth was the infection detected? 48hours  
Number of arthritis (joint ill) per annum, 0  
When was the joint ill detected?  
Diarrhoea in calves? 22  
Respiratory diseases? 3  
Wounds , abscesses and flegmones? 1  
Ingestion/colic? 0  
Wounds caused by the interior? 1  
Claw diseases? 0  
Fractures of bones, muscle or tendon injury? 0  
Lameness? (Scale 1 –4) 4  
Eye infections? 0  
Bloat? 4  
Heart diseases? 0  
Skin disorders? 0



## **6 Farm Data**

Name of Farmer; Keneth Harrison

Name of Farm: Downbawn dairy farm

**Type of Farm**, dairy or beef? Dairy

**Keeping system: Tied or loose in free stall boxes or individual boxes or small groups?** loose in a midsized barn, cows were separated into two barns

Calves: separated from other animals individual pens for 7/8 weeks then together in pasture outside.

2 Management

**Is it a family farm?** yes

**Does the farm have employees?** No all work is done by the farmer

**Who assists in calving? Farmer, employee or vet?** Mainly the farmer, vets are called when an emergency occurs.

**Written protocol for calving? Does the farm have one?** No the farm is a of moderate scale with no protocol.

Are there maternity pens are non-maternity pens present: no

**Are calves separated from mother?** If so When? No the calves are not separated immediately they are allowed remain with the cow until vital colostrums has been received they then move to group pens were milk replacer is given. After this the calves are moved to another barn where they are kept in groups of twelve.

**When and how do the calves receive their fist colostrums?** Within the first 2 hours post parturition, Colostrum is freshly naturally sucked from the cows teats. The farmer ensures the sucking occurs within 30 to 40 minutes post parturition.

**How much Litres does the calve drink of colostrums at first?** Between the time of 2 to 6 hours the calf need to drink up on four litres colostrums.

3 Hygiene around calving

Component Criteria paid attention to

**First impression of the farm?** This farm dirty consisting of mainly old sheds.

**Extent to which the farm is tidy and cleaned?** The farm was not well cleaned; manure was visible on the yard surface and the buildings.

**First impression of the barn ?** The sheds were of small to medium size and the roof was low. The roof had a some openings to allow ventilation.. The floor was made up of solid concrete and concrete slats which manure and urine could fall to the underlying manure pit.

**Feeding trough and drinkers**, the feed was silage provided in the middle passage of the shed. The floor was very dirty and dust particles were all through the air. The water drinkers were not all working and some leaked onto the bedding.

**Humidity?** Mild

**Cobwebs**, yes there was a thick covering on cob webs seen on the roof and walls.

**Manure:** The floor was made of concrete slats so when the cows feaced and urinated it falls below to a manure tank. The shed had no electronic scrappers. So there was a build up of manure.

**Impression of Manure?** There a lot of old and fresh manure on the floor and the walls. The smell was overwhelming.

**Equipment**, all equipment was old and of moderate cleanliness

**Impression of the waiting area?** The cattle prior to moving to the milking parlour enter in to a holding bay. This area had no coverage. The floor was very old and had breaks all along the concrete. Some loose concrete was visible. The farmer milked the cows twice a day and manually scrapped the milking parlour and loading bay when he had time.

**Floor Presence of dirt?** Moderate to high amounts

**Feeding path/?** There was dust and manure present

**Floor/slats?** The floor was a combination of concrete slats and concrete.

**Bedding material?** bedding was used ,for this a thick non dusty straw bedding was first preference, the straw was not clean and appeared wet.

**Water troughs?** Placed along the back of the shed they were clean and all working.

**Climate in barn?** The moderately ventilated area and had some manure odour.

**Illumination in barn?** Lighting was of moderate standard the strength of the lighting was slight.

**Ventilation** ; was poor air did not seem to circulate well.

Preventive measures:

**1 farm clothing**, moderately clean clothes was worn by the farmer. Boots were dirty.  
**2 hygiene regime**, on arriving to the farm visitors and workers must be free from illness. I was asked to dip my boots in the disinfectant bath provided on enter and exit of the farm. However the dipping bath was very old and the water and disinfectant were stale.

**3 Manure disposal and built in scrapers.** Barns were not equipped with electronic scrapers. Once a week the farmer with aid of a tractor and attached scraper cleans the passage of the barn. Manure was stored in an outdoor slurry pit with no cover on it. From the shed where there was concrete slats, manure and urine flowed to the slurry pit and made its way to the outdoor slurry pit.

**4 Isolated roof,** the roof of the barn was isolated with a mesh cover but not on all parts.

**5 Type of roof and ventilation.** Ventilation was poor. The roof had small square opening allowing some air in

**6 Wind breaking screens, present or absent.** There was no wind breaking screens

Hygiene check list

When I questioned the farmer I also scored a large number of hygiene aspects in the stables, sheds and surrounding areas. on a scale from 1 to 5, where 1 was clean

2 was mild dirty

3 was moderate dirty

4 was very dirty

5 was extremely dirty

The areas inspected were then grouped into categories:

1 milking unit, 4

2 bulk tank room, 3

3 cattle housing, cubicles, floors. 3

4 Area of calving barn or stables 3

5 New born calve pens 3

6 Also the number of cows and calves as well as their hygiene score based on a scale of 1 to four.

Three zones of the body were evaluated they were as follows,

1 Udder

2 lower leg

3 Upper leg and flank

**What kind of bedding is used before calving?** Some straw was used in each the calving pens

**How clean is the bedding before, during and after cleaning?** The straw was of poor to mild cleanliness.

What type of bedding is used in the calving area? Calving pens had a straw bedding. The bedding was shallow

**What kind of hygiene protocol is used in between different calvings?** The farmer had no hygiene protocol but cleaned the calving pens when they were very dirty.

**Do the farmers disinfect the calving area pre-calving, at calving and post calving**  
? pre calving. What kind of disinfectant is used? Iodine solution was sprayed on bedding prior to each calving.

**How clean are the cows before calving (scored 1-4)** out of 50 calving the average cow score for this farm was 4

**How clean are the cows after calving : 4**

4 Around time of calving

Number of normal births? (per annum) 47

Number of assisted births? (per annum) 12

Number of distocia? (per annum) 0

Number of retained placentas? (per annum) 2

Number of problems during involution ? (per annum) 1

Number of mastitis infections? (per annum) 2

Number of single calves born? 47

Number of twin calvings? 0

5 Calf diseases

Number of umbilical infections per annum? 0

How long after birth was the infection detected?

Number of arthritis (joint ill) per annum, 0

When was the joint ill detected?

Diarrhoea in calves? 13

Respiratory diseases? 5

Wounds , abscesses and flegmones? 5

Ingestion/colic? 0

Wounds caused by the interior? 5

Claw diseases? 4

Fractures of bones, muscle or tendon injury? 0

Lameness? (Scale 1 –4) 8

Eye infections? 0

Bloat? 0

Heart diseases? 0

Skin disorders?