

The Case Against the Veal Crate

An examination of the scientific evidence that led to the banning of the veal crate system in the EU and of the alternative group housed systems that are better for calves, farmers and consumers.

Carol McKenna, Compassion in World Farming, April 2001

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Conversion notes – imperial equivalents to metric measurements are given. Values used are 1cm/0.39 inch; m/3.28 feet; square metre/1.2 square yards; kilogram/2.2 lb; tonne/1.1 ton.

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Photographs: veal crate and group-housed systems

Introduction

At first glance the Allevamenti Due V agricultural company's farm in the flatlands of Mantua, northern Italy, is completely unremarkable: a simple farmhouse and two large sheds filled with calves, surrounded by maize fields and cypresses. But this farm is one of a new breed across Europe in which improved animal welfare is benefiting calves, farmers and consumers alike.

The 1,800 calves are penned in groups (group-housed) in which they are free to move around. They can interact with each other, stand up and lie down normally, eat solid food from a trough and drink milk replacer twice daily. This may not seem in any way extraordinary or even noteworthy, except for one thing: these are calves being reared *for veal*, traditionally denied the freedom of performing such basic behaviours.

Veal is the name of the light-coloured meat from young calves, produced since ancient times by using surplus cow's milk to rear a fattened calf for special occasions. Within the European Union veal consumption has traditionally been most popular in France and Italy. The Italians have been fond of veal ever since Roman times and it is the basis of most of their meat dishes.ⁱ During the pre-war period the taste of veal was reportedly made even better for the French palate by feeding raw eggs to the calves.ⁱⁱ In her epic 'History of Food' published in 1987, Toussaint-Samat commented: "It is hard to imagine such a state of affairs now, when calves are hobbled (and) battery reared".ⁱⁱⁱ For in the last 50 years the production of veal has become one of the most intensive of agricultural systems and its calves among factory farming's most pitiful victims.

Intensive rearing of calves for veal developed in the 1950s to handle surpluses of male calves and skimmed milk from the dairy industry.^{iv} Calves began to be confined individually in rows inside farm buildings and fed on an all-liquid diet of milk replacer, severely restricted in iron to ensure white meat and denied the solid feed necessary for normal development. Today this is how most calves reared for veal in Europe and the USA are forced to spend their brief lives. This system is commonly described as the veal crate system and the veal crate is a term that has come to be used to describe the two types of individual confinement systems in use for calves being reared for veal. Firstly, partial stalls (open at the rear) in which the calf is tethered by the neck to the front of the stall and secondly, enclosed boxes, sometimes called pens, in which the calf is confined but not tethered. However, some producers may tether calves in these for the first few weeks in order to prevent them turning around.^v After about two weeks they would have difficulty doing so because of their size.

The crates are traditionally made of wood with a slatted floor. The sides may be solid so that the calf cannot normally see or touch its fellows (common in the USA and France^{vi}) or they may be barred, permitting visual and some tactile contact. The calves are fed from buckets attached to the front of the crates.

John Webster, Professor of Animal Husbandry, Head of the Veterinary School at the University of Bristol and one of the UK's leading experts on dairy cattle has described the veal crate system as "one of the most bizarre and, in my opinion, unequivocally cruel forms of livestock production".^{vii} To this day, most calves reared for veal in the EU are still confined individually in crates so narrow that after a few weeks they are unable to turn around and groom themselves

properly, adopt a normal sleeping position or even stand up and lie down without difficulty. But veal crates, long condemned by veterinarians, animal behaviourists and overwhelming numbers of consumers, are now being abolished in the EU.

Since 1998 EU welfare legislation has made it illegal to build or rebuild a veal crate unit and has required farmers to provide calves with a diet “adapted to their age, weight and behavioural and physiological needs, to promote good health and welfare”.^{viii} They therefore receive a minimum daily ration of fibrous food containing a certain amount of iron.^{ix} This legislation, the 1997 Directive laying down minimum standards for the protection of calves, will ban the use of all veal crates from 31 December 2006.^x

The adoption of this legislation by the EU represented a major victory for animal welfare campaigners against the huge and powerful veal industry: in 1997 alone the three main veal producing countries – France, Italy and the Netherlands – produced nearly 700,000 tonnes of veal between them.

Legislation to achieve a ban on the veal crate was achieved only after lengthy and concentrated campaigning. In the UK the Brambell Committee established by the Government to consider animal welfare in the new factory farming systems, condemned the methods of rearing calves in the ‘white veal industry’ as early as 1965. After hearing expert evidence it called for calves to be given a diet containing iron and roughage, to be reared in individual pens of sufficient size to allow freedom of movement, including space to turn around, with sufficient clean straw or other bedding on which to lie down.^{xiii} Nevertheless it was not until 1987 that the UK Government introduced legislation to prohibit the veal crate system: that legislation came into force in 1990.

Within the EU, the European Commission (EC) first proposed the phasing out of veal crates in 1989. This followed earlier calls from the European Parliament and its Agriculture Committee for a ban. A Directive adopted in 1991 laying down minimum standards for the protection of calves was widely criticised for failing to introduce a ban, although it did set a minimum width for individual crates of 90 cm (35.1 inches) (plus or minus 10 per cent) or 0.80 times the height at the withers, thereby stimulating a move to keeping calves in groups on economic grounds as the increased fixed cost to the crated calf producer made group housing more competitive. Fortunately, for the progress of animal welfare standards in the EU, this Directive also made provision for amendments on the basis of a report from the European Commission’s Scientific Veterinary Committee (SVC) on “the intensive farming systems which comply with the requirements of well-being of calves” and stated that this should be submitted to the Council of Agriculture Ministers no later than 1 October 1997.

In 1995, the Council of Agriculture Ministers bowed to public and political pressure, spearheaded by a coalition of leading European animal protection groups, and agreed to bring forward the SVC report. The report was published later that year, and, comprising a review of some 40 years of scientific evidence, was the final nail in the coffin of the veal crate in the EU. It led directly to the introduction of the 1997 Directive, which prohibits the use of veal crates from 2006.

The campaign against veal crates was based on the view that farm animals should not be treated as ‘resources’, ‘commodities’ or ‘things here for our use’ but as sentient beings with their own dignity and intrinsic value and a right to respect and moral solicitude. The campaign’s most basic premise was that a farm animal should at least have ‘pleasure in life while it lives and then be

humanely slaughtered”.^{xiv} Consumers shared these views and substantial reductions in veal consumption occurred. In 1987, Donald Broom, Professor of Animal Welfare at Cambridge University, commented, “Many people will not eat white veal because they do not like the production system and it is likely that the numbers of people with this attitude will increase”.^{xv}

The feelings and welfare of animals are now recognised by the EU, where attitudes have changed significantly since 1957 when the founding Treaty of Rome classified animals as goods or ‘agricultural products’. In 1997, all the EU Member States agreed to include in the Treaty of Amsterdam a legally binding Protocol aimed at ensuring improved protection of animals and respect for the welfare of animals as sentient beings. The Protocol requires the EU, in formulating and implementing its policies on agriculture, transport and research to “pay full regard to the welfare requirements of animals”. The Protocol was achieved because of the immense support given to animal welfare issues by the EU public. Indeed, the European Commissioner for Health and Consumer Protection commented in a recent press release that he received more correspondence on animal welfare than on any other single issue.^{xvi}

Farm animal welfare legislation in the EU is based on the 1976 European Convention for the Protection of Animals Kept for Farming Purposes, which aims to ensure that animals are cared for in a manner that meets their natural biological and behavioural needs on the basis of “established experience and scientific knowledge”.^{xvii} The campaign to ban the veal crate achieved success *only* when it received the backing of science and demonstrated that veal could be produced both humanely and economically in group-housing systems. Operators like Allevamenti Due V are already proving that group housing is commercially successful.

This Italian company produces 65,000 calves for veal a year at 51 farms. Half of these calves are now group-housed and the company is changing over to group-housing as quickly as possible. Managing Director Gian Luca Vercelli stresses that the new EU veal farming legislation did not prompt their abandonment of the veal crate system. “What veal producers want to do is to produce meat with the necessary kinds of characteristics at minimum cost. The group system, managed in the right way, gives a better result technically and therefore economically. We are adopting this system because we can produce meat at a lower price, because it is better for the farmer and we have better results”.^{xviii}

In Brabant in Holland, Toon and Rene Peters, father and son contract farmers for Navobi, one of the two leading veal companies in Holland, have just invested around half a million Dutch guilders (c. \$202 000) in a new building for 462 calves kept in penned groups of seven with a space allowance exceeding the requirements of the EU Directive. They used to keep calves only in veal crates. Today, the only regret of both father and son is that they did not convert to group-housing ten or twenty years ago.

The growth of group housed veal production in Holland has been dramatic. Today about 60 per cent of all veal producing farms use group housed systems^{xix} compared to 22.9 per cent of Dutch calves being group housed in 1995 and just 4.7 per cent in 1985.^{xx} Martin Kelders, Navobi District Manager for the southern Netherlands reports “group-housed calves give better results than crated calves”.^{xxi}

This report is aimed at assisting debate in countries that continue to permit the individual confinement of calves for veal production. Section One introduces the EU veal industry, examines the scientific basis for the EU ban on veal crates and includes comparison of the health and welfare of crated calves with that of group housed calves. Section Two reports on more

humane alternatives to the veal crate in use in the EU and refers to the practical experience of European farmers.

Section One

The EU Veal Industry

Production

France is the EU's main veal producer despite a decrease in production of 16 per cent between 1990 and 1999. It produced 242 800 (267 080 tons) equivalent carcass weight in 2000, compared to 204 000 tonnes (224 400 tons) in Holland and 153 200 in Italy (168 520 tons).^{xxii} Table 1 shows the developments in veal production for these countries in the years preceding the adoption of the 1997 EU Directive prohibiting veal crates. French and Italian production had been declining and Dutch production had been increasing.

In 1999, while 35 000 fewer calves were slaughtered in France than the previous year, for the first time since 1990 the tonnage of veal meat produced increased (by 1.2 per cent) because of an increase in slaughter weight of an average of 4kg (8.8lb) per head.^{xxiii} In 1999, the two other main producers also increased their tonnage production: Italy by 1.4 per cent and the Netherlands by 6 per cent.^{xxiv} However, in the Netherlands in 2000 slaughter weights decreased by 4.8 per cent, a development probably related to eligibility for a slaughter premium for which the maximum weight is 160 kg.^{xxv} The average EU carcass weight is now 133.5 kg (293.7lb) compared to 135 kg (297lb) in 1999. For France it is 127.6 kg (280.72lb).^{xxvi}

Consumption

Most veal in the EU is consumed in France, Italy and Germany where the figures per annum are respectively 5kg (11lb), 3.95kg (8.69lb) and 1.15kg (2.53lb) per head.^{xxvii} In some countries including the United Kingdom and the Netherlands, veal is not at all popular and is used mainly in the hotel and restaurant trade. The Netherlands, the second largest veal producer, exports 95 per cent of its production and Dutch veal represents 45.6 per cent of German consumption, 32.6 per cent of Italian consumption and 16.6 per cent of French consumption.^{xxviii}

In France veal is mainly purchased for home consumption. In fact French household consumption represents around 75 per cent of total veal consumption.^{xxix} Surveys of veal consumption show that there have been substantial reductions in several EU member states since the mid-1980s: between 1988 and 1994 French consumption fell by 25 per cent to a then all-time low of 5.1 (11.22lb) kg per head.^{xxx}

Veal is expensive compared with other meat. For example, in France the price of veal increased continuously between 1980 and 1985 and by 1.5 per cent between 1998 and 1999.^{xxxi} The increases in veal meat prices have tended to be greater than increases for other meat products.^{xxxii} 1999 prices for a kilogram (2.2lb) of veal meat purchased for household consumption in France average 75.1 francs (c. \$10.10), in Italy 18 390 lire (c. \$8.43) and in Germany 21.6DM (c.\$9.80).^{xxxiii} The average European cost of veal increased by 0.8 per cent in 2000 and was 4.71 euro/kg net (c.\$10.83/2/2lb net).^{xxxiv}

In the face of falling consumption the French meat industry has been trying to reduce production costs and improve the image of meat products.^{xxxv} This has proved difficult for veal because along with a relatively high price it has a negative image with consumers who consider that its production system is too industrial.^{xxxvi} There is no doubt that the public's negative perception of the veal industry helped the campaign to ban veal crates in the EU and that the public outcry, inspired by awareness campaigns aimed at highlighting the conditions in which veal was produced, was no doubt partly responsible for the general decline in veal consumption.

In the UK it took little time for veal to become 'a dirty word'. "Few foods have raised as many hackles as veal" wrote one journalist recently, adding "even those who don't in principle mind eating doe-eyed baby animals might balk at tucking into one that has spent its short life in a crate, deprived of light, bedding and all food but milk, unable to move or lie down properly".^{xxxvii} Highlighting a decision to give a £150 000 (c. \$212 745) marketing grant to a new scheme to produce welfare veal, the UK Ministry of Agriculture Fisheries and Food (MAFF) contrasted the planned animal friendly production methods "with the intensive farming methods that have put many consumers off buying veal on ethical grounds".^{xxxviii} In the Netherlands group housing of calves for veal started about fifteen years ago when the largest supermarket, Albert Heijn, decided that it would not sell veal from animals kept in crates.^{xxxix} This step resulted in the establishing of welfare standard for group-housed veal production.^{xl}

Publicity about the availability of 'welfare veal' has also led to sales increases. In 1995 Safeway's, one of the top four UK supermarkets, reported that following publicity on the cruelty of veal crates and the availability of high welfare British veal in their stores "sales of veal increased by 30 per cent".^{xli} In the UK, Marks and Spencer reports that although veal is very much a niche product, demand has increased. "This is attributable to an increased interest in Italian food but also because of the improved welfare standard for calves reared for veal".^{xlii} In Denmark annual consumption of veal increased to 2kg (4.4lb) per head from a low of 0.5kg (1.1lb) following development of light red veal from group-housed calves fed with milk and roughage.^{xliii} Moreover, a 1995 Gallup public opinion poll revealed that 64 per cent of French and 45 per cent of Italians were prepared to pay 10 to 15 percent more for humanely produced veal.^{xliv}

For many consumers, the veal crate ban may be said to have improved the veal industry's image. 1999 and 2000 saw EU veal consumption per habitant at a stable 2kg per annum.^{xlvi}

This information may be of particular relevance to the USA where some 800 000 calves are reared for veal each year. Most are tethered by the neck in individual stalls, usually 61 – 66 cm (23.79 - 25.71 inches) wide and 1.6 - 1.8m (5'2 - 5'85 feet) in length.^{xlvi} Numerous scientific investigations have established that stalls of this size severely restrict limb movements; make it difficult for calves to stand up and lie down and do not give them enough room to adopt a normal lying posture let alone turn around.^{xlix}

A US study of the effects on calf growth performance of rearing calves in crates with widths of 56, 66 and 76cm (21.84, 25.75 and 29.64 inches) by Terosky and others (1997) found little difference between these three crate widths but concluded: "Neither increased costs nor lack of negative production or physiological data may be adequate justification for how veal calves are housed".¹ The authors suggested: "The long-term consequences of negative public perception associated with an existing production system could encourage an industry to change to an

alternative system, perhaps ensuring that the questions of animal treatment, including space and freedom of movement, receive appropriate ethical treatment”.

Table 1

Total carcass production of calves reared for veal slaughtered in France, Italy and the Netherlands
(1000 tonnes)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
France	292	289	289	272	265	259	255	251	246	249	243
Italy	217	214	207	194	194	182	180	159	147	150	153
Netherlands	165	176	184	187	194	194	192	196	198	210	204

Source: Eurostat and Ofival.

Table 2

Changes with time in the mean veal calf consumption in France, Italy and Germany
(1000 tonnes of carcass equivalent)

	1988	1991	1994
France	354	325	295
Italy	290	283	265
Germany	109	108	102

Source: Report of the EU Scientific Veterinary Committee, 1995.

The Welfare of Crated Calves

As has been mentioned the Scientific Veterinary Committee (SVC) of the European Commission examined the welfare of calves specifically “on the intensive farming system(s) which comply with the requirements of the well-being of calves from the pathological, zootechnical, physiological and behavioural point of view, as well as the socio-economic implications of different systems, together with proposals relevant to the report’s conclusions”. An expert working group was established by the SVC under the chairmanship of Donald Broom, Professor of Animal Welfare at Cambridge University.ⁱⁱ The following section reports on the SVC’s review of the scientific evidence and gives a summary of the committee’s conclusions.

The needs of calves

The European Convention for the Protection of Animals Kept for Farming Purposes requires farm animals to be reared in conditions that meet their “*physiological and ethological needs in accordance with established experience and scientific knowledge*”.

According to the SVC “the criterion for acceptability of management systems should not be survival and growth but the satisfaction of needs and hence good welfare”. A need was defined as “a requirement, which is a consequence of the biology of the animal, so to obtain a particular resource or respond to a particular environmental or bodily stimulus” that is determined by the basic biology of the animal. Consideration of the biology of calves by the SVC identified the following basic needs:

- A nutritionally balanced digestible diet
- Rest and sleep
- Exercise and exploration
- Avoidance of disease and parasitism
- Social interaction with other calves

Examination of the scientific evidence reviewed by the SVC reveals that calves reared for veal in crates on an all-liquid diet are unable to fulfil these needs. As a result they develop high levels of stereotyped and abnormal behaviours such as tongue rolling and tongue playing that “are not shown by calves able to cope well with their environment”.^{lii}

A nutritionally balanced digestible diet

There are three main problems concerning the diet of calves reared for veal in conventional systems: (1) feeding milk in a bucket, (2) the lack of solid food and (3) the low levels of iron in the diet.

A calf is biologically adapted to ingest colostrum initially, then milk and finally pasture plants. Colostrum is the cow’s first milk and contains maternal antibodies to protect the young calf against the common infections that it is likely to encounter during its early life. The gut is adapted to absorb large immunoglobulin molecules from colostrum only for a short period after birth and this is why a calf instinctively searches for and attempts to suck from a teat soon after birth.

This need to suck and search for colostrum and then milk results in the well-known desire of calves to suck objects in their reach, especially if they are teat-like. Moreover, this desire is so strong, the calf persists in such behaviour even when its gut is filled with milk. The SVC Report stresses: “The licking and sucking behaviour itself is of importance to the calf.”

Rearing calves in deprived conditions without a teat leads to the development of abnormal oral behaviour that may be stereotyped and to the conclusion that the availability of artificial teats is likely to be of importance for the calf’s welfare.^{liii} Abnormal behaviours include “exaggerated sucking of teat-shaped objects, such as a non-nutritive teat”^{liiv} or, in the case of group-housed calves milk-fed by bucket, of parts of other calves.^{li} Numerous research studies from as early as 1954 showed that feeding with an artificial teat feeding greatly reduces the incidence of navel sucking among group-housed calves.^{livi}

Cattle are ruminants with a four-chambered stomach digestive system adapted to digest fibrous grasses. At the age of two to three weeks a calf would normally begin to eat pasture plants or similar food that stimulates the development of tiny finger-like protuberances called papillae that project all over the inside of the rumen (or first stomach). Plant food is stored in the rumen for fermentation, a process necessary to release nutrients. After fermentation, the food is returned to

the mouth for chewing before being passed to the next stomach for digestion. At four months of age, a calf can spend 6 hours a day grazing and also several hours ruminating or chewing the cud.

Most calves reared in veal crate systems are denied access to any solid feed and are fed a liquid milk replacer – a mixture of milk, tallow and vegetable fats and other types of proteins from cereal, vegetable or fish sources. Professor John Webster states this “completely distorts the normal development of the rumen” and predisposes the calf “to infectious enteritis” (scouring or diarrhoea) and “chronic indigestion”.^{lvii}

Calves whose rumen does not develop normally are more likely to be found to have hairballs in the rumen at slaughter. One reason given by the SVC for this is that hair that is ingested is not passed on down the gut but remains in the rumen. A further reason may be that calves denied solid food show more preference for self-licking and hair ingestion. The accumulation of hairballs in the rumen can impair digestion.^{lviii}

Indigestion and enteritis may also be caused by forcing calves to drink twice-daily large quantities of milk from a bucket. A calf suckling from its mother takes about 6-7 good milk feeds a day and drinks at a rate that is limited by the flow of milk through a teat. This ensures that the milk flows directly into the abomasum (fourth stomach) where it can be digested properly. Bucket-feeding and an all-liquid diet can lead to ruminal drinking in which milk flows back into the rumen from the abomasum (fourth stomach) leading to poor digestion, poor growth and severe economic losses.^{lix}

An all-liquid diet does not only affect the physical or physiological development of calves leading to indigestion and enteric disease but also denies them the opportunity to perform the normal behaviours of rumination and chewing.^{lx} As a result they develop abnormal oral activities in an attempt to satisfy their need to ruminate. These are characterised by sucking, licking or biting inanimate objects, and by tongue rolling and tongue playing.^{lxi} In a study by van Putten and Elshof (1978) this ‘sham rumination’ occurred in individually housed milk fed calves for two hours a day.^{lxii} Webster (1985) found that ‘purposeless oral activity’ occupied a mean of 15 per cent of the time in crated calves but only 2–3 per cent in group-housed calves. Studies show that provision of straw to calves reduces the occurrence of these oral stereotyped behaviours.^{lxiii} Professor Broom has commented, “There is no doubt that the tongue rolling etc. must be regarded as abnormal and an indicator that welfare is poor”.^{lxiv}

Traditionally veal producers have objected to providing solid feed for calves as it might increase iron intake and prevent the production of white meat. The SVC report, however, refers to research by Moser et al (1994), showing that while keeping calves on straw does not reduce the number of white-meat carcasses, hay does produce meat that is pinker in colour.^{lxv}

Another reason for producers denying solid feed cited by the SVC are indications of higher mortality rates for calves reared in groups on straw reported by Bertrand and Martineau (1995). The SVC dismissed these reports “as they do not permit a proper analysis of factors contributing to mortality (such as diet, housing design and provenance of calves) and nor do they distinguish between diseases of dietary origin (such as diarrhoea) and other infections such as pneumonia”.

The SVC considered the association of keeping calves on straw with an increased incidence of small ulcerations and erosions of the abomasum (fourth stomach) commenting that it would be logical to assume that straw alone may be “an unsuitable solid feed for young calves, since the digestibility of the fibre is so low and it contains insufficient degradable protein to stimulate a

satisfactory microbial population in the rumen”. The Committee highlighted successful studies in which calves were fed computer-controlled amounts of liquid feed plus a concentrate ration balanced for starch, fibre and degradable protein.^{lxvi} It concluded “controlled feeding of small amounts of roughage and concentrate properly balanced to stimulate normal fermentation and rumen development is likely not only to meet the need of the calf to ruminate but also reduce the risk of digestive diseases such as infectious diarrhoea”.

Over 60 per cent of calves reared for veal slaughtered at 3 – 4 months of age show lesions, small ulcerations and erosions, of the abomasum.^{lxvii} Professor Webster points out that these are common in all calves but pass unnoticed unless the animals are slaughtered. He says “although not unique to calves being reared for veal they are probably worse than in conventionally reared animals probably as a function of the quantity of milk consumed at a single meal and worse still in those that are given straw as their only solid food since this is poorly fermented in the rumen and passes into the abomasum where it causes mechanical irritation.”^{lxviii}

The other dietary factor influencing both the health and welfare of calves reared for veal is that they are kept in an anaemic state to produce white meat. Their dietary intake of iron is restricted to achieve a target mean haemoglobin concentration of around 4.6 millimoles/litre (mmol/l). The SVC describes such calves as “undoubtedly iron deficient”. A normal concentration of haemoglobin in the blood is greater than 7mmol/l.

Research by Morrissette et al (1995) cited by the SVC reported that at a haemoglobin level of 4.5 to 5 mmol/l, 95 per cent of veal calf carcasses are still graded 1 or 2; that is to say, they were white enough for the premium price.^{lxix} Research by Gygas et al (1993) found that calves with blood haemoglobin concentrations of below 4.5mmol/l show clear signs of increased disease susceptibility and immunosuppression.^{lxx} Studies by Piquet et al (1993) of exercise in even slightly anaemic calves show they can have problems and cope less well.^{lxxi} The traditional all-liquid, low iron diet fed to calves being reared for veal is clearly inadequate. The SVC described the extent of abnormal behaviour in calves fed only milk as “very substantial” adding: “the welfare of calves older than 4 weeks fed only such a diet is not good”. Indeed, “calves fed on a milk diet with no solid feed would die before adulthood so it is clear that such a diet is not sufficient for healthy growth”.

The SVC concluded:

- **“Calves which lack specific nutrients, including iron, which are given a poorly balanced diet and which are not provided with adequate roughage in the diet after four weeks of age can have serious health problems, can show serious abnormalities of behaviour, and can have substantial abnormalities in gut development. Every calf should receive a properly balanced diet with adequate nutrients.”**
- **“Every calf should be fed fermentable material, appropriate in quality and sufficient in quantity to maintain the microbial flora of the gut and sufficient fibre to stimulate the development of villi in the rumen. Roughage, in which half of the fibre should be at least 10mm (0.4 inches) in length, should be fed to the calves. They should receive a minimum of 100g (4 oz) of roughage per day from 2 – 15 weeks of age, increasing to 250g (10oz) per day from 15 – 26 weeks of age but it would be better if these amounts were doubled.”**

- **“All calves should be fed in such a way that their blood haemoglobin level does not fall below a minimum of 4.5 mmol/litre.”**

Rest and sleep

A young calf may spend up to 80 per cent of its time lying down. Ethological studies have been carried out into the lying postures of calves to assess the space they need in order to adopt normal resting and sleeping postures and stand up and lie down normally.^{lxxii} These have found that calves use several resting and sleeping postures some of which involve stretching the legs or resting the head on the legs. The space needed depends on the position the calf adopts and the position the calf adopts is determined by the available space.

Research by Smits and de Wilt (1991) found that in calves reared in pens about 1.65m (5.36 feet) long by 0.70m (27.3 inches) wide, the incidence of lying with legs extended and the head turned back on the shoulder or belly decreased rapidly as the calves grew and thus had less space to adopt this position.^{lxxiii} Inability of calves to lie in this position may interfere with sleep.^{lxxiv} Webster (1986) concluded that calves in crates 75 cm (29.25 inches) wide cannot lie flat with their legs extended.^{lxxv} Ketelaar-de-Lauwere and Smits (1991) concluded that in order to lie with legs outstretched, calves weighing 170 – 300kg need crates measuring 80 – 90 cm wide (31.2 – 35.1 inches).^{lxxvi} According to Webster et al (1986) denying calves the opportunity to adopt a normal sleeping posture is “a significant insult to welfare” and he and his fellow researchers, concluded that to overcome this crates would need to be at least 90cm (35.1 inches) wide.^{lxxvii}

Where lack of space prevents the adoption of a normal resting posture, calves respond differently dependent on the size of the crate. They may lie with all four legs bent; in a crate of adequate length but inadequate width, they will spend more time lying with the front legs extended and in a crate that is too short they will lie on their sternum with front legs bent.

Ketelaar-de-Lauwere and Smits (1991) also found that calves in crates have needed more time to stand up or lie down and had difficulty in changing positions because of lack of space.^{lxxviii}

Calves may also wish to lie flat with their legs extended when they feel warm and wish to lose heat. A calf in a crate measuring less than 90cm (35.1 inches) in width cannot follow this process and will be forced to stand up in order to avoid overheating. Webster et al (1986) commented that well-grown calves reared for veal in temperatures above 20°C may feel uncomfortably hot and “denying them the opportunity to adopt a position designed to maximise heat loss only makes things worse”.

The SVC concluded, “there is evidence of increasingly poor welfare as pen width decreases” and stated:

- **“Every calf should be able to groom itself properly, turn around, stand up and lie down normally and lie with its legs stretched out if it wishes to do so.”**
- **“If the preferred system, group-housing, is not possible then individual pens whose width is at least the height of the calf at the withers and whose length is at least the length of the calf from the tip of its nose when standing normally to the caudal edge of the tuber ischii or pin bone x 1.1 should be used.”** This formula ensures that a calf can turn around.

Exercise and Exploration

Calves need to exercise in order to ensure normal bone and muscle development.^{lxxxix} At pasture calves not only walk but also run about, jump and play.^{lxxx} Calves confined in veal crates cannot turn around let alone walk or run. Older calves confined in crates measuring “less than 1.7m long by 80 cm wide (5.52 feet by 31.2 inches) are, said the SVC report “severely restricted in their ability to make normal limb movements”. The SVC experts commented, “If calves cannot move their limbs sufficiently they are likely to be severely distressed and their ability to carry out certain movements will be impaired”. When finally taken out of their crates to go for slaughter, calves may stumble or have difficulty walking. Research by Trunkfield et al (1991) found that some calves kept in individual pens until 6 months of age had difficulty walking when released from the pens to go to slaughter, and this fact is often reported in the industry.^{lxxxii}

Young animals need to avoid danger. They instinctively explore their surroundings and hide or try to escape if faced with a perceived danger. All calves show exploratory behaviour^{lxxxiii} and many scientists believe that the frustration of normal exploratory and escape behaviours contributes to the high incidence of oral stereotypies, self-licking and hair ingestion in confined calves.^{lxxxiiii} Research by Webster and Saville (1981) found that calves kept in poorly lit buildings show excessive fearfulness of humans^{lxxxv} and found that such calves have higher levels of stereotypies that may be caused by their inability to explore.^{lxxxvi}

Calves tied with tethers shorter than their body length can stand up and lie down only with difficulty. Turning around and walking are impossible. They are often unable to groom themselves, interact socially or explore. Research by Friend et al (1985) shows that the welfare of tethered calves is worse than that of untethered calves in crates.^{lxxxvii} The SVC pointed out that calves can become tangled in their tethers and injured. Professor Webster describes tethering as “a profound insult to animal welfare”.^{lxxxviii}

The SVC concluded:

- **“In order to provide an environment which is adequate for exercise, exploration and free social interaction, calves should be kept in groups.”**
- **“Tethering always causes problems for calves...Individually housed calves should not be tethered.”**

Avoidance of disease and parasitism

Disease and parasitism result in poor welfare and animals have basic biological mechanisms that have evolved to reduce disease incidence. For calves these involve ingesting colostrum, grooming to keep the body clean and to help in heat regulation and foraging for food to satisfy nutritional deficiencies.

The SVC stressed the importance of calves being able to groom their whole body and stated “inability to groom [only] part of the body will cause problems”. There is evidence that calves make considerable efforts to groom themselves thoroughly and it is clear that they have a need to groom adequately.^{lxxxix} Studies of crated calves, however, show that they are unable to reach the

hind part of their bodies^{lxxxix} and that grooming behaviour may therefore become stereotyped^{xc}. It may be that their inability to groom the hind part of the body increases the desire to groom the parts they can reach, leading to excessive grooming such as self-licking, resulting in much hair ingestion and the formation of hairballs in the rumen.^{xcj}

The greatest threats to the health and welfare of the young calf are infections, which may cause septicaemia, enteritis (inflammation of the intestines leading to diarrhoea or scours) and pneumonia. The organisms responsible for these conditions are widespread and young calves, especially those that are moved through markets are practically certain to be disposed to some degree of infection. In such incidences veterinary treatment is important.

It is often argued by producers opposing legislation to prohibit veal crates that disease incidence and mortality are much higher in group-housing systems. Yet, as reported in Section Two of this report 'Alternatives to the Veal Crate', far from encouraging sickness group housed systems actually reduce its incidence among calves reared for veal. European farmers report that group housed calves are far more resistant to disease. They say group housed calves grow better, suffer less illness, have fewer lung problems because they can move freely and recover more quickly from pneumonia than they do in crate systems. Their reports are borne out by savings in veterinary costs and independent scientific analysis. Not surprisingly, they also report that working with group housing systems is much more pleasant and rewarding.

As will be reported, a three year project on a UK government research farm, involving 570 calves reared in 10 different batches in groups in straw yards, found that far from being prone to illness the calves proved remarkably robust, with mortalities at only 2.6 per cent, well below the 5 to 8 per cent that are the norm in most commercial veal units. Health problems were "minimal, with very little scouring [diarrhoea]".

The SVC examined a number of comparisons of veal crate and group housing systems. More diarrhoea was found in group pens by Perez et al. (1990) by Olsson et al (1993) and by Smits and Ham (1988).^{xcii} However, Peters (1986) reported more diarrhoea in crates.^{xciii} Webster et al 1985b found no difference in the incidence of enteric disease between group-housed and individually housed early-weaned calves.^{xciv} Waltner-Toews et al (1986c) found no difference between individual pens and group reared calves.^{xcv} Webster et al 1985b, Waltner-Toews et al (1986c) and Smits and Ham (1988) found no difference in the incidence of respiratory disorders between the two systems.

In 1986, the Department of Animal Husbandry of Bristol University published the results of a seven-year scientific study of production, health and welfare in calves reared for veal.^{xcvi} One of the most effective alternatives to the veal crate proved to be ACCESS (A Computer-Controlled Eating Stall System) in which calves equipped with transponders, received controlled amounts of milk replacer or digestible dry food contributing respectively to 90 per cent and 10 per cent of nutrient intake. With this system, food conversion efficiencies were achieved comparable to those in crates (1.5 – 1.6 in both cases).

Professor Webster commented, "Moreover, the health of the calves" compared to those kept in crates "was greatly improved by eliminating the worst abnormalities of feeding and housing".^{xcvii} 36 per cent of crated calves suffered from enteric disease compared to less than 8 per cent in the ACCESS system and 9 per cent of crated calves suffered respiratory disease compared to 3.2 per cent of calves reared in the ACCESS system.

As will be seen from the following table the study found lower, in some cases dramatically lower, incidences of mortality, enteritis (diarrhoea), respiratory disease, digestive disorders and other diseases and losses in a group housed system with computer controlled feeding than in the traditional veal crate.

	Crated calves	Computer Controlled feeding in groups
Total calves at start	68	63
Percentage incidence		
Deaths and culls	9.0	Nil
Enteritis (diarrhoea and associated signs of ill-health).	36	8.0
Respiratory disease (e.g. coughing, laboured breathing and fever)	9.0	3.2
Digestive disorders other than diarrhoea	19	Nil
Other disorders	1.5	13
Other disease and losses	75	24

Source: Department of Animal Husbandry of Bristol University, 1986

An extensive two-year study in the Netherlands reviewed by the SVC concluded that there was no difference in mortality between a group housed system and traditional veal crate system (2.9 per cent for the group-housing in both 1993 and 1994 and 2.8 per cent and 2.9 per cent for the individual system). Moreover, as will be reported in the next section European farmers report that the overwhelming majority of veal calf deaths occur in the first month on the farm and are independent of the system used.

Recent scientific research and commercial experience in Italy, discussed in the next section of this report, shows that veterinary costs can be dramatically reduced in group housing systems. Indeed, research by Allavementi and the Istituto Zooprofilattico di Brescia has found that the immunology profile of group-housed calves was twice that of those reared in crates and veterinary costs were 40 per cent lower. Professor Broom has also stated that, in general, calves kept in crates have to be given extra medication to ensure that they survive.^{xviii}

The more productive the animal, the more metabolic heat it produces, so the greater its tolerance to cold but the greater its susceptibility to heat. Well-grown calves by virtue of their very high intakes from a high-fat liquid diet are extremely tolerant of cold but very sensitive to heat. Webster reports (1984) that in temperatures above 20°C in veal units, calves will sweat profusely and may wish to drink water, rather than milk replacer containing water, to avoid further heat production.^{xcix}

The all-liquid milk replacer diet of crated calves causes health problems. The SVC Report recommended the provision of solid feed to avoid the problems of indigestion and enteric disease associated with the failure to ensure some degree of normal rumen development. It should be recalled that Webster et al (1986) stated that the prevention of such normal development predisposes the calf “to infectious enteritis” (scouring or diarrhoea) and “chronic indigestion”.^c Webster describes the incidence of enteritis and respiratory disease in crated calves as “unacceptably high” and kept under control “only by the liberal and repeated administration of antibiotics”.^{ci}

The SVC concluded:

- **“Calves are vulnerable to respiratory and gastro-intestinal disease and welfare is poor in diseased animals. Better husbandry is needed to minimise disease in group-housing conditions but that results which are as good as, or better than those from individual housing can be obtained.”**
- **“Calves that are diseased and those which are in hot conditions need to drink water as well as milk or milk substitute and all calves drink water if it is available. The provision of milk or milk substitute is not an adequate alternative for the provision of water. Hence calves should be provided daily with water to drink. It is recommended that drinkers be provided in all pens.”**

Social interaction with other calves

The need for social interaction is very obvious in bovine animals. A calf’s first instinct is to seek its mother. They soon form a strong bond. Le Neindre (1993) states that in natural conditions a cow would continue to suckle its calf 3 – 6 times a day for up to 5 months.^{cii} Comparison of mothered and motherless calves reveals that mothered calves stand earlier, drink more colostrum and are more active.^{ciii}

Calves can survive without their mothers but their health and welfare are improved if they are offered some substitute in the form of companionship for the contact and care that their mothers would have provided. Research shows that when their mother is present calves group together after 1 – 2 weeks.^{civ} In the absence of their mother, calves choose to associate with other calves from the age of 7 days onwards^{cv} and seem thereby to compensate for the mother’s absence by a higher level of interaction with their peers.^{cvi}

Le Neindre (1993) concludes that a calf confined in a veal crate “lacks social contacts and suckling opportunity and has a poor general environment”.^{cvii} Crated calves will endeavour to make contact with other calves. However, many calves are confined in crates with solid walls that prevent visual or tactile contact with their neighbours.

Various studies have compared the behaviour of calves kept in visual and tactile isolation to calves kept individually but allowed to see and touch their neighbours.^{cviii} Isolated calves spent much time with the head out of the front of the pen and when their heads were inside the pen they spent more time licking and rubbing themselves and licking parts of the pen than did non-isolated calves or calves kept in pairs. Veissier and Le Neindre (1994) compared calves with different degrees of social contact in individual pens and concluded that solid partitions resulted

in considerably more licking of walls.^{cxix} The SVC report concluded, “It is clear from this evidence that solid partitions between pens do not allow adequate social contact for calves”.

Comparisons of the welfare of group-housed and individually housed calves

Examination of physiological and ethological scientific studies by the SVC showed that group housing on straw represents the least problems for calf welfare and individual housing with no social contact results in the most problems. Studies by Friend et al (1985) indicated that the combined effects of lack of straw and social contacts, as well as reduced stimulation and space, are a source of stress to crated calves.^{cx}

It is difficult to attribute the benefits of group housing to any one factor, for example increased space or the possibility of exploring, but the SVC experts noted “the very strong preferences demonstrated by calves for social contact make it likely that social interaction represents a very important part of the improved welfare”.

Abnormal behaviour is often found in crated calves, is less common in small groups housed on slats and generally absent in groups kept on straw. The improvement in welfare seems to be partly because of opportunities for social interaction, partly to the greater space and partly to the provision of straw.

Van Putten and Elshof (1978) found that the provision of straw reduced but did not eliminate excessive self-licking in crated calves. Webster et al (1985) reported that calves provided with straw in individual crates spent 15 per cent of their time in “grooming” and 14 per cent of their time in “purposeless oral activity” as compared with 6 per cent and 3 per cent respectively of their time in group housing.

Studies have shown that tongue rolling was much more frequent in individually reared calves than in calves reared in groups.^{cxii} The SVC concluded, “the factors of social contact, stimulation and space have a significant effect upon the incidence of stereotypical behaviour independently of the provision of straw. Chazal (1994) recorded a lower level of stereotypies for calves housed in individual pens with slatted floors when social contact was available.^{cxiii}

Calves kept individually in large crates, ranging in size from 70cm by 1.5m (27.3 inches by 4.87 feet) to 1.7m by 2.5m (5.52 by 8.12 feet), performed oral stereotypies for 20–30 per cent of the time^{cxiii}, seeming to show, said the SVC that “lack of social contact or of other stimuli are the cause of the poor welfare rather than just the amount of space”.

The SVC commented that the many scientific studies demonstrate that apart from the importance of providing straw, “the availability of full social contact, stimulation and space which group penning provides has a significant effect upon the calf’s welfare”.

The SVC Report concluded:

- **“Calves need resources and stimuli which are normally provided by their mothers. All calves should be given adequate food and water, appropriate conditions of temperature and humidity, adequate opportunities to exercise, good lying conditions, appropriate stimuli for sucking during the first few weeks of life and social contact with other calves from one week of age onwards.”**

- **“Where calves cannot be kept with their mother, the system where welfare is best is in groups with a bedded area and an adequate space allowance available to them.”**
- **“Appropriate bedding, for example straw, is recommended.”**
- **“The welfare of calves is very poor when they are kept in small individual pens with insufficient room for comfortable lying, no direct social contact and no bedding or other material to manipulate.”**

Recent Research into the Welfare of Calves reared for veal

The conclusions of the SVC report published in 1995 are supported by subsequent scientific studies.

Space

When comparing the effects on calves of veal crates measuring 56 (21.84 inches) 66 (25.74 inches) and 76 (29.64 inches) cm wide, Terosky et al (1997) found a general increase in knee and hock swelling as stall or pen width decreased. Calves housed in the 56 cm (21.84 inches) pens had difficulty in changing from a standing to a lying position and could not lie with one or more legs extended towards the end of the production cycle. The researchers commented, “This is in agreement with Le Neindre 1993 who concluded that calves housed in smaller size pens kept knees and hocks bent while lying. This posture might have contributed to the increased joint swelling in the smaller pens.”^{cxiv}

Wilson et al (1999) found increased cortisol levels over time in calves kept in the above-mentioned crates and concluded this showed “an increased degree of stress for calves” in the all the crates involved in the study.^{cxv} Calves were observed performing stereotypic, repetitive behaviours of tongue playing, including tongue rolling, investigative activities including licking or smelling accessible objects (stall, chain, tether, bucket, bucket holder etc) and chewing of these.

Studies by Gottardo et al (1997) found that calves in individual crates less than 75 cm (29.25 inches) wide are forced to keep their legs bent, cannot adopt a comfortable position and are unable to groom themselves normally.^{cxvi}

Diet

Terosky et al (1997) reported that calves fed an all-liquid diet and reared in crates averaged 5.2 hairballs with 3.9 hairballs less than or equal to 5.1cm wide (1.98 inches, 1.3 hairballs between 5.1 and 10.2 cm wide (1.98 and 3.97 inches) and 0.05 hairballs wider than 10.2cm (3.97 inches). The authors noted, “Most cattle and calves fed solid feeds and ad libitum water do not accumulate hairballs, in contrast to calves reared for veal, which are fed only milk replacer and limited water”.^{cxvii}

Gottardo et al (1997) noted that calves denied solid food develop abnormal behaviours.^{cxviii}

Morrisse et al (1999) compared three groups of calves reared in crates 0.81 m (31.59 inches) wide by 1.7 m (5.52 feet) long and tethered for the first five weeks. The animals were fed either an all-liquid diet or milk replacer diet supplemented by either a total of 10 kg (22lb) or 25 kg (55lb) of pellets during the fattening period.^{cxxix} 85 per cent of the calves fed the all-liquid diet had hairballs compared to 20 per cent of the calves that received 10 kg of pellets and 10 per cent of calves that received 25 kg of pellets. This accords with previous studies showing hairballs in 80 – 90 per cent of calves fed an all-liquid milk replacer.^{cxxx} The authors said that the drastic reduction in the number of hairballs observed by giving solid feed could not be explained by a reduction of grooming activity, as levels were similar in all treatments. Calves given solid food showed normal rumen development and those given most showed improved daily weight gain by 9 per cent and carcass weight by 6.5 per cent. The provision of solid feed did not create any significant difference in the frequency of slight erosions to the abomasum of calves in the different groups. The authors concluded that supplying calves with straw-cereal pellets meets the SVC's criticisms concerning physiological impairments observed in calves reared for veal fed an all-liquid diet.

Veissier et al (1998) commented that “Tongue-rolling seemed to come from a cumulative effect of the lack of social contacts and of feeding activities, since it appeared mainly in calves housed in stalls and fed milk only”. Regarding the provision of solid food these researchers noted “calves that had access to solid foods gained more weight, owing not only to an increase in gut contents but also to heavier carcass weight” and that “the provision of appropriate concentrated food and then of chopped straw has no effect on abomasal ulcers or carcass quality while it largely reduces non-nutritive nibbling”.^{cxxxi}

Social Interaction

Veissier et al (1997) compared the behaviour of 64 calves in individual crates 90 cm by 2 m (35.1 inches by 6.5 feet). Half were given a tyre and piece of chain on which to nibble. Those kept in social isolation and deprived of objects on which to nibble exhibited more self-directed activities (lip-licking and tongue-rolling) and greater (fear) reactions than those permitted social contacts and objects for nibbling.^{cxxxi}

Comparisons of the welfare of group-housed and individually housed calves

Research by Andrighetto et al (1998) compared the effect on growth, behaviour and meat quality of calves reared for veal in individual tether stalls with group housing.^{cxxiii} Both groups received an all-liquid diet. The individual stalls measured 60 cm (23.4 inches) wide as is traditional in Italy^{cxxiv} and 1.4m (4.55 feet) long. The group housed calves were reared three to a pen with a space allowance of 1.5 sq m (1.8 sq yd) each (less than specified by the 1997 EU Directive). The study found that the increased space allowance and freedom of movement allowed by the group pen improved veal calf welfare as shown by both behavioural measurements and growth performance.

The crated calves in the study spent more time lying with all legs bent. Those in groups more frequently adopted “comfortable resting postures” with one or more legs outstretched. The tethered calves were observed tongue rolling. Group pen calves touched each other with more

frequency. Those tethered in crates tended to address their attention more to the surrounding environment or to themselves.

The authors commented, “the move to group housing of calves should not in anyway penalise the growth performance of the animals. On the contrary the experimental investigations we carried out showed, in the final part of the production cycle, an increase in weight gain and of food conversion in calves reared in groups compared to calves reared in crates. These results demonstrate that the isolation of animals in crates, chained in too narrow a space, limits not only locomotory activity but also induces a status of physical and mental stress that makes the feed conversion and the rhythm of body development worse.”^{CXXV}

There were no differences in carcass weight and dressing percentage but the carcasses of the group pen calves had a better conformation. The group calves’ meat displayed reduced cooking losses and was considered more tender and tasty by an expert panel conducted according to the guidelines of the American Meat Science Association. The authors considered that the positive effect of the group pen housing on veal meat tenderness arose from the movement allowed by this housing system and cited previous studies on pigs and sheep that showed similar results. The group-housed calves, however, showed a higher haemoglobin concentration than the crated calves resulting in ‘pink’ meat that the authors said did not meet consumer preference. They recommended further studies to reduce the negative effect of group housing on meat colour. As will be reported in the following section, commercial group-housed producers interviewed do not experience problems with meat colour.

The conclusion of this study was that the results obtained “with the individual crates were not satisfactory from an ethological and productive point of view and supported their future substitution with group pens”.

Section Two

Alternatives to the Veal Crate

The previous section has proven that rearing calves in veal crates and feeding them only a liquid milk replacer diet is a significant abuse of their welfare. The physiological and ethological needs of calves are not met by this farming system. The veal crate fails to meet all five freedoms:^{cxxvi}, against which experts measure farm animal welfare:-

- | | |
|---|--|
| 1. Freedom from hunger and thirst by ready access to fresh water and a diet to maintain full health and vigour | The calves are deprived of solid food. This completely distorts gut development and encourages the formation of hairballs that may lead to chronic indigestion. The lack of dietary iron in the diet renders calves anaemic. |
| 2. Freedom from discomfort by providing an appropriate environment including shelter and a comfortable resting position. | The calves are enclosed in individual crates that make it impossible for the calf to turn around, let alone to get up and lie down normally. When over 150 kg (330lb) it is impossible for them to adopt normal resting and sleeping postures, nor groom themselves all over |
| 3. Freedom from pain, injury and disease by prevention or rapid diagnosis and treatment. | Research shows that the incidence of enteric and respiratory diseases is unacceptably high in calves kept in crates. ^{cxxviii} |
| 4. Freedom to express normal behaviour by providing sufficient space and proper facilities and company of the animals own kind. | The calves are denied any exercise or direct social contact. |
| 5. Freedom from fear and distress by ensuring conditions and treatment, which avoid mental suffering. | Calves show abnormal behaviours and stereotypies not found in calves able to cope well with their environment e.g. tongue rolling. |

The wealth of scientific studies examined by the SVC and subsequent researchers confirm the need to replace the veal crate with more humane group housed systems. Donald Broom, Professor of Animal Welfare and Chairman of the SVC expert working group on the welfare of calves says: "It was scientific evidence that led to the Directive banning veal crates in the EU."^{cxxix} Politicians, even those from the main veal producing countries, could not hold out against the comprehensive scientific evidence of poor welfare in crates, the availability of commercially viable alternatives and the support of European consumers for a ban. The legislation adopted was based on the advice of the SVC and further details concerning the provisions of the Directive are given in Appendix 1.

Group housing systems are criticised by producers in countries that have yet to prohibit veal crates. They imply that welfare-friendly group housed systems are inherently unhealthy and less successful commercially. This is untrue. As demonstrated in the previous section, established scientific experience shows overwhelmingly that results from group housing systems can be either the same or *better* than those obtained using crates. Commercial producers using group-housed systems are also finding this to be the case. Their experiences are reported below.

Most of the group-housed systems currently in widespread, successful commercial use in the main EU producing countries involve rearing small groups of calves on slatted floors without bedding. Professor Broom describes such systems as “a lot better than crates” but adds “welfare is better still if straw is supplied both [for the calves] to manipulate and as bedding”.^{cxxx}

Straw-yard group-housed systems are in use in the UK where they have been promoted by animal welfare organisations (see Appendix II for details of the Freedom Food Standard of the Royal Society for the Prevention of Cruelty to Animals (RSPCA) and successive Governments as part of the campaign to achieve a EU-wide veal crate ban. UK legislation for group-housed veal production is stricter than in the EU and details appear in Appendix 1.

Group-housed veal production in the UK

Recently much publicity has been given to a new group housing initiative, Veal Cymru, which has established a demonstration unit in Wales in a converted storage shed. Calves are reared in groups in pens that are mostly straw-bedded and fed at computerised feeding stations, around which there is a slatted area, on a four-times a day cycle. Each pen is fitted with a ball suspended from the roof, dummy teats and brushes against the wall where calves can groom themselves. Water is available at all times in drinking bowls.^{cxxxii}

Tony Clifton, the company’s Managing Director, a calf dealer and former exporter of live calves, describes the rearing system as “ keeping calves in a natural environment: they’re in a herd, in sub-groups of about 30 animals. They have 3 sq metres (3.6 sq. yards) of floor space each, straw-bedding and natural lighting and seem happy and contented”.^{cxxxii} The aim is to rear the calves to a slaughter weight of around 300kg (660lb).

There are currently two pilot study farms: the demonstration unit and a farm in East Sussex from which the first veal produced was exported to customers in Italy and Belgium in July 2000. Clifton describes the veal as ‘rosy pink’ in colour and reports that customers are very happy with it, “one Italian customer asked for more three days after receiving the first consignment”.

Veal Cymru is in partnership with Serval SA, a French veal specialist company and Anglo-Dutch Meats in Kent. These companies aim to supply farmers with calves, milk, and technical back up and market the meat. The farmers supply buildings, labour, water, and electricity and lease the feeding stations and computer monitoring equipment from Serval. On-screen data about each calf’s feed intake, weight and growth is continually up-dated from ear tag microchips.

Another initiative in the North of England has received a marketing grant from the UK Government’s Agriculture Development Scheme. Rose Veal UK Ltd involves three Cheshire farmers and is being backed by Meadowvale Foods, the food processing and marketing arm of Lloyds Animal Feeds group of companies and Dutch firm Vitelco which is providing expertise

from its extensive background of marketing rose veal in Europe. So far 100 pubs and restaurants have used the veal and the response has been “excellent”.^{cxxxiii}

In 1995 a veal demonstration unit, funded by the UK Government was established at a Ministry of Agriculture, Fisheries and Food research farm. The project aimed to find the best methods for producing high quality, welfare-friendly veal and also to show financial viability.^{cxxxiv}

A total of 570 calves were reared in 10 different batches during the three-year project. All were purchased at two weeks of age and loose-housed in groups of 11-12 in straw bedded pens. Each calf had a space allowance of 3.2 sq. m (3.84 sq yd), nearly double the minimum specified in EU legislation. Warm milk substitute was available to them on demand via an automatic feeder and fresh drinking water at all times.

Average daily weight gains of 1.06kg (2.33lb), 1.08kg (2.37lb) and 1.13kg (2.48lb) were recorded for Hereford cross heifers, Continental cross heifers and Holstein/Friesian bulls respectively. The calves were slaughtered at 20, 22 and 26 weeks in years one, two and three respectively and feed conversion efficiencies were 1.94, 1.98 and 2.05 during these years. Net profit was closely linked to calf purchase and sale price and peaked with a net profit of £43/calf (c. \$60.98) with Hereford cross heifers.

Far from being prone to illness the calves proved remarkably robust, with mortalities at only 2.6 per cent, well below the 5 to 8 per cent that are the norm in most commercial veal units. Health problems were “minimal, with very little scouring [diarrhoea]”.

With veal colour, the project aimed to provide the calves with enough iron for health but low enough to produce the salmon pink meat required by the UK veal market. To test this iron content of the finishing milk powder was varied and blood samples taken at different times. Additionally, the colour of the resulting veal was assessed. Of those samples tested, all met the acceptable colour standard.

The results of the project show that quality veal can be produced humanely and also economically. They also show that far from being breeding grounds for illness as some traditional veal producers claim, well-managed group housing systems can be significantly healthier environments than veal crates.

Dennis Chapple, a senior research consultant who oversaw the project says: “The system works extremely well. The profitability doesn’t depend on the system, though; it depends on buying a cheap calf and marketing it at the right price.”

“If done properly group housed systems can be as good as veal crate systems for calves, if not better - if you’ve got a sick calf on a crated system the first thing you do is give it bedding”.^{cxxxv}

Group – housed veal production in the Netherlands

Group housing is more widely used in the Netherlands than in France and Italy. The Dutch were amongst the first to pioneer the system in the mid-1980s. Since then the growth of group systems has been rising steadily year-by-year. Today, about 60 per cent of Dutch veal farms are using group housing systems and Dutch farmers using group housing have their own industry standard,

the “Producert” of which details are given in Appendix 11, which may be overseen on their behalf by the Deltacon company.

Andre Wisselink, Managing Director of Deltacon and Producert explains that problems experienced when group housing was first used in the 1980s have been solved. The result, says Wisselink, is that Dutch farmers “are frantically changing to group housing - stable builders are very busy indeed.” The stables they are building - light, airy and comparatively spacious - are a far cry from the old dark, damp, claustrophobic veal crate units they are fast replacing.

The economic success of these new farms and, to some extent, the welfare of the calves on them is encouraged by the contract farming system that is widespread in the EU. Most of Holland’s group housing farms are under contract to food companies, of which the Van Drie Group, of which Navobi is part, and Alpuro are among the biggest. The farmers provide the farm infrastructure, the companies supply them the calves and feed. The farmers are paid for each animal they rear to slaughter and also receive bonuses according to the classification, colour and fat percentage of the veal they produce and, importantly for the calves’ welfare, the health of their livestock.

Group housing, says Wisselink, requires more management, knowledge and skill from a farmer, not least because he must give his stock more attention. “If he wants a good result it’s more work, but once he knows how to do it the results are better.”

The benefits of group housing to the calves are self-evident. “When you walk into a [crated] system the calves are fearful and nervous,” says Wisselink. “In group housing they are relaxed, curious and not frightened at all.” Dutch group housed calves receive at least 1kg (2.2lb) of roughage per day, which he says enables them to develop a normal digestion system. This boosts their health yet has no effect on the colour of the veal.

Some traditional veal producers, notably in the US, cling to their crates claiming the group system causes sickness, infection problems, is expensive to run and staff. “Those farmers here who have picked up the new system and are doing well with it would laugh at such notions,” says Wisselink. “The group housing system means calves grow better and suffer less illness. The work is much more pleasant for the farmers *and* more rewarding.”

A Navobi Farm

The benefits are clear to Peters senior and junior, who farm 1,000 calves for veal for Navobi at Brabant in Holland. Their farm features two newly built group-housing sheds that are a far cry from the veal crate units he gave up using several years ago.

One shed houses 462 calves in six rows of 11 groups, each containing seven penned animals. Each pen is 14.56 sq m (17.47 sq yd) giving each calf 2.06 sq m of space (2.47 sq yd). The floors are wooden slats. No bedding is supplied and neither, in general, is drinking water. The building has natural ventilation, controlled by a computer that opens and closes curtains according to temperature and wind direction.

The calves are fed milk and maize twice daily. Peters believes in giving plenty of roughage: “It is good for growth and for animal welfare.” By the time they are slaughtered each of his calves will

have eaten 300kg (660lb) of maize, twice the Dutch average. The iron content of the roughage and that of the calves' blood is regularly monitored.

Peters says that good management is crucial with group-housed systems, especially when it comes to the speed at which different calves drink milk. "You have to watch the animals better with this system, you need to look at the group and see which calf is last to come to the milk. You must chalk on the pen which one wasn't drinking very quickly yesterday so you can check its progress today.

"But this system does *not* mean more work than the individual box system. Feeding is fast and the roughage is delivered with a small tractor. Another benefit is that because the calves can move freely their lungs work better, which causes fewer lung problems." In particular, he says, group housed calves that suffer pneumonia - a problem generally in veal farming - recover more rapidly.

"You are more a farmer with this system. It's more about management. You have a better relationship with the animals and it is definitely better for them. It proves that if you treat the calf right then the calf will do right for you as well".^{cxxxix}

The Peter's Farm® System

Peter's Farm® is one of the divisions of the Alpuro Group. The system it uses is based on groups/herds averaging 60 calves and with a maximum of 80. "The animals are able to walk around freely in large areas with daylight and fresh air," says the director of Peter's Farm®, K. Mulderij. "There are many objects for the calves to be able to distract themselves with in the living areas: skippy balls, tires on chains, empty jerry cans to knock about, or salt licks and pacifiers to suckle. They are also able to look outside". The calves are fed at automatic feeding stations with milk supplement and multi-grain feed mix permitting calves to decide for themselves when and how much they wish to eat. The floors of the pens are entirely slatted.^{cxl}

The system was established in 1997 with a policy of openness. The Peter's Farm® website at www.petersfarm.com posts photographs of a farm every ten minutes daily between 9.00 and 17.00 Central European Time. On every veal product sold there is a product code whereby the consumer is able via the Internet to trace back to the farm where the veal was raised. Blind tasting of the veal organised by an independent organisation^{cxli} found that veal from Peter's Farm® "is more tender, has a higher degree of taste and is valued overall higher than regular veal".^{cxlii}

Farmers using the system say there are satisfied to see the calves showing more natural behaviour than in individual or the conventional Dutch group-housing system: "We are even closer to the calves than in other systems," says farmer J. Arts "You really get a better feel about their character and their behaviour. There is also more information available (from the computer monitoring) which allows you to optimise the system and to be able to offer a better living environment. We are much more flexible in our time management. The work is less labour intensive. All of these points make it a more positive experience for us".^{cxliii}

The Dutch Society for the Prevention of Cruelty to Animals has stated that it is pleased with developments such as Peter's Farm® and has scored the system positively^{cxliv} for:

- Provision of freedom of movement
- Social contact where large groups are brought together
- Possibilities for the calves to carry out self grooming behaviour
- Enabling calves to suckle in a natural position
- Providing distraction through toys and open doors for viewing outside
- Public transparency of the production system

A research study comparing the behaviour and welfare of calves raised in the Peter's Farm® with that of calves reared in veal crates and conventional group systems (small groups in slatted floor pens) was carried out on 18 farms by the Faculty of Ethology of the Agricultural University of Wageningen. The authors concluded that calves in Peter's Farm® "are kept under conditions more beneficial to animal welfare than the calves in individual housing and conventional group housing".^{cxlv}

Group-housed veal production in Italy

On farms run by Allevamenti Due V newly arriving calves are divided into groups according to breed, size and age. They spend the first 20 days separated in the pens by rails through which they can see and touch each other. These barriers are then removed allowing the calves to move freely thereafter within the pen in groups of four, five or six with each calf having a space allowance of 1.8 sq m (2.16 sq yd). The sheds that house the pens have natural light and ventilation, with some having blue artificial night-lights.

The calves receive two feeds of milk per day and two of maize silage roughage. The roughage allowance starts at 20g (0.8oz) per day, rises to 500g (20 oz) after 60 days and finally to 1.5-1.75kg (3.3lb – 3.85lb) when they are older. Water is provided only in hot summer weather but the company is currently experimenting by giving some calves water for two to three hours a day.

The group-housed calves are reared for longer, typically for 175 days compared to 155 days for crated calves. The difference in weight gain is negligible: 1.114kg (2.45lb) per day for the group calves compared to the 1.180kg (2.59lb) increase seen in those that are crated. Yet, crucially, the conversion of food to meat is significantly better in the group-housed calves: each puts on between 590-600gm (23.6oz – 24 oz) for every kilo (2.2lb) of food milk replacer eaten while a typical crated calf gains 550-560gm (22oz – 22.4oz).^{cxlvi} This results in the group housed calves attaining a live weight prior to slaughter of 10 to 13kg (22lb – 28.6lb) more on average than crated calves.

The resulting veal is exactly the same colour as that produced from the crating system. But there is one distinct difference according to Allevamenti Due V managing director Gian Luca Vercelli: "Tests have shown that the group housed veal is more tender, which disproves the ideas of some in the industry that allowing calves to move makes their meat tough."

Proponents of veal crates often claim that group housing is more labour intensive. The Allevamenti farms disprove this. At the company's Mantua farm only three staff are needed to tend 1,800 calves while at another farm in nearby Reggio Emilia four people maintain 1,250 group-housed calves. The company says that feeding group housed calves is much quicker.

Says Vercelli: "Working with a group system is more stimulating and better for the farmer. He has to work less with his hands and more with his brain."

The mortality rate in 1999 was 3.9 per cent. Vercelli says: “Ninety per cent of all mortality is in the first month and is not dependent on which system is used. It has far more to do with the age of the calves when they arrive on the farm and whether they have received enough colostrum to strengthen their immune systems. The younger the calves are on arrival, the higher the mortality rate.” For this reason Allevamenti tries not to buy calves younger than two weeks old and Vercelli believes that there should be a law to prohibit the movement of calves less than 15 days old.

Calves reared in Allevamenti’s group housing system are far healthier than those reared in crates. Says Vercelli: “The welfare improvement that the new kind of stabling brings the animal gives it more resistance against infectious diseases.”

This means they need far less medication. “Investigations have been carried out by us, in co-operation with the Istituto Zooprofilattico di Brescia, which have found the immunology profile of group-reared calves was double that of ones reared in crates, with extremely clear empirical data of what this means on the farm: *the consumption of medicines for group calves is 40 per cent lower.*”^{cxlvii} On average this means a saving in medicinal costs of 15,000 lire (c. \$6.88) per calf.

Vercelli also reports that the group-housed system improves farm profits with heavier group housed calves, with better texture veal, fetching more than typical crated calves. Small wonder that his company is anxious to discard its remaining crates - 50 per cent of its calves are still crated - as soon as possible.

Vercelli is keen for other farmers to reap the benefits of the group-housed system but stresses that farmers have to be prepared to make the necessary investment: “Unfortunately veal from the two systems is not separated and labelled at the point of sale in Italy. This needs to be done so that more farmers are motivated to change to group housing.” Labelling and marketing of group housed veal would also assist farmers considering the poll that showed 45 per cent of Italians are prepared to pay 10 – 15 per cent more for humanely produced veal.^{cxlviii}

Group-housed veal production in France

Most French calves reared for veal are reared in crates measuring mainly 60cm by 1.6m (23.4 inches by 5.2 feet) or 70cm by 1.8m (27.3 inches by 5.85 feet). There are also several quality labels for veal under which calves are fed organic milk or entire milk or mother’s milk. For example, some 300,000 calves in France are traditionally reared each year with their mothers under a scheme called ‘veaux élevés sous la mère’ (calf raised with its mother) The veal from this system is sold under the Label Rouge and is regarded as a premium product. Marc Beaujeau, the buying manager for Personal Catering, eulogises this veal saying: “This is a different way of raising the animals that is far more humane. The calf suckles from its mother in the field, fully at liberty until it is slaughtered. The meat turns out more red than crate-raised veal but in my opinion it has a better flavour”.^{cxlix} Unfortunately, Ghislain Zuccolo, of Protection Mondiale des Animaux de Ferme, Compassion in World Farming’s French partner organisation, reports that in reality it is rare for calves to be reared with their mothers, instead they are confined and/or tethered in crates but released to be taken to their mother twice a day to nurse.^{cl}

Ofival, the French veal industry body, reports that as a result of the imposition of welfare standards by the EU, one in every ten veal farmers is ceasing production.^{cli} This has made room in the market for new producers and companies such as Serval and producers' co-operatives are actively prospecting for new farmers to take the place of those who are quitting.

Daniel Chérel, responsible for Serval's production, explains that farmers who become contract veal producers for Serval are guaranteed an income. "A farm with 200 places will result in 60,000 francs net per year (c \$8069). This production is interesting for young farmers or farmers looking to diversify. Investment in new buildings is about 5,000 francs per place (c. \$672). The banks are interested in these projects because remuneration is guaranteed".^{clii}

Serval is backing the Veal Cymru scheme in the UK. At the official opening of the first Veal Cymru unit Serval president Gerard Lemaitre said the company was already linked to veal production in Canada, Italy, Spain, Portugal, Greece and South Africa.

Serval automated feeding stations used by Veal Cymru were developed by veterinarian Pierre Bouffet. At a French farm using his system calves are reared in straw yards in groups of 20–25 and fed on a four-times a day cycle as they are at the demonstration unit in Wales. Bouffet says: "This breeding system requires three times less work than intensive systems since a computer handles everything." He states that the calves reach their slaughter weight more quickly "in 120 days rather than 140" and at one month old "a calf bred in a group weighs 9kg (19.81lb) more than one bred in a crate".^{cliii}

Pierrick Delonglée, a French farmer with 440 calves reared for veal, has already converted one of his buildings from crates to a group system. He opted for a system of 4 groups of 60 calves on slatted floors with automatic feeders. The cost amounted to 1,500 fr (c \$201.73) for each place. He says: "I wouldn't want to go back, there's not a lot less work but there's a lot more flexibility because you're not tied to set feeding times. The work is more pleasant, you have more contact with the animal and they're generally less stressed. This will give another image of veal to consumers".^{cliv}

An Economic Perspective

Economic comparisons of veal production in crates versus group housed systems on slats or on straw will depend on the actual costs and conditions in place at the time. The SVC Report analysed the costs of increasing the size of individual crates and of converting existing systems to group-housing or building new group-housing units. They found that buying feed accounts for about 45 per cent of the total cost of veal production with the purchase price of calves making up 30 per cent. Fixed costs (housing and labour) made up 15 per cent and other costs 10 per cent.

The SVC found, not surprisingly that investments per calf in buildings and housing materials "increase considerably with larger pens in individual housing systems and more space in group housing". However, the expert committee concluded that there is little difference in both fixed costs and net profit between the two systems. An European Commission statement, in January 1996 reported: the cost of changing from individual pens with an area of 1.4 sq m (1.68 sq yd) per calf to group housing with an area of 2.0sq m (2.4 sq yd) is about 0.06 ECU (c. \$0.05) per kilogram (2.2lb) (slaughter weight) or an increase in costs of about 1.1 per cent".

One issue that affects profitability of all veal is the colour of the meat. Providing higher levels of iron in the diet in order to ensure that calves do not suffer anaemia can result in meat that is pink rather than the pale pink (called white) traditionally required by the Continental veal industry and its consumers. Some producers, for example, Tony Clifton of Veal Cymru, see this as a marketing advantage as they wish to distinguish their veal from the white veal that consumers associate with poor welfare. However, the SVC reported that the keeping of calves on straw does not necessarily have an effect on meat colour and that “it seems that calves can be kept so that their welfare is good without any effect on meat colour”.

The SVC highlighted surveys of veal consumption which show substantial reductions in several member states over the past 7–10 years, some of which “is likely to be due to concern over welfare of animals” and concluded that the veal industry would remain under pressure unless producers “are perceived to be keeping animals in a way which results in good welfare”.

The key component of profitability is the purchase price of the calf. Professor Webster has argued “It is dangerous to attempt too detailed an analysis of the economics of veal production because costs vary so much. The major determinant of profitability in a veal enterprise is the purchase price paid for the calf. Veal is profitable only when calves are cheap”.^{clv}

This view is shared by other veal producers and experts interviewed for this report. Dennis Chapple, who ran the 3-year group-housed veal demonstration unit for MAFF referred to above, explains: “Profitability...depends on buying a cheap calf and marketing the calf at the right price. If calf prices are high and sale prices low, then there will not be a good profit”. Martin Kelders of Navobi says: “The most important factor regarding profitability is the market situation. How much you pay for the animal when you buy it and how much you get for it when it goes out”.

The condition in which calves arrive at the farm has an important bearing on profitability. Some research with calves reared for veal suggests that the initial transport from the dairy farm, with intermediate stops at market, can profoundly reduce the calves health and welfare.^{clvi} Professor Webster explains, “Such animals are deprived of normal food, water and physical comfort and are confused, exhausted and exposed to a wide range of infectious organisms of which the most important are the Salmonella bacteria. By the time they reach their rearing unit they are likely to be infected, dehydrated and stressed and need special care if they are to survive.”^{clvii} Mortality rates and the amount of medication used are likely to be lower, if the calves arrive at the unit when they are at least 14 days old and if they travel directly from their place of birth.

Perhaps the most important factor regarding the economics of group-housed veal production is that it is being carried out successfully on a wide-scale in the Netherlands. It is economically viable and examination of production statistics shows that veal production has been increasing in the Netherlands for some time whereas it has been declining in France and Italy.^{clviii} French veal producers complain: “Every time a veal place closes in France, one opens in the Netherlands”.^{clix} Leading food retailer, Marks and Spencer reports: “We have worked with our Dutch supplier for a long time. Sales have been increasing which shows that group housing can be done successfully, both from the farmers point of view and the calves.”^{clx}

Conclusion

The rearing of calves in crates has been proven by science to be seriously detrimental to their welfare. The evidence is both comprehensive and overwhelming. The 1995 review of the scientific evidence by the Scientific Veterinary Committee of the European Commission led directly to an EU-wide ban on veal crates.

Both scientific research and the experience of commercial producers have shown that the more humane group-housed systems are not only better for calf welfare but also commercially viable. The expert report of the Scientific Veterinary Committee states that group housed veal systems can produce “results that are as good as, or better than, those from individual housing”.

Commercial producers interviewed for this report said that they obtain better results from group housing than from crate systems. As has been reported, Professor John Webster, one of the UK’s leading experts on dairy cattle and a member of the SVC expert working group, condemns crates not only because of their cruelty but also because “research shows that the incidence of enteric and respiratory diseases is unacceptably high in calves kept in crates”^{clxi} and “is often kept under control only by liberal and repeated administration of antibiotics”.^{clxii}

The continued use of veal crates when more humane alternatives exist and are in widespread and successful commercial use therefore equates to the infliction of unnecessary cruelty and suffering on calves. Producers using crates are putting the future of their own businesses at risk: they face declining sales as more and more people become aware of and concerned about the inherent cruelty of veal crates.

Compassion in World Farming hopes that the information in this report will be used by all those who are concerned about animal welfare to ensure that veal crates are phased out in all countries where they continue to be used. Professor Donald Broom, Chair of the SVC Working Group says: “The key to change is to have a system in which welfare is better but the cost is not much different and to ban the bad system or ensure that products from it are not bought”.

Group housed veal: better for calves, farmers and consumers.

Recommendation

Scientific evidence and established experience demonstrate that the rearing of calves in veal crates on an all-liquid diet is unacceptable. Compassion in World Farming calls for veal crates to be prohibited in all countries which still permit their use; for consumers to help by refusing to purchase crated veal and for farmers to adopt group-housed systems that satisfy the physiological and ethological needs of calves. Compassion in World Farming recommends that calves in such systems should:

- Be kept a) with their mothers, or b) a foster mother or c) other calves
- Have sufficient space and type of flooring to be able to perform normal exercise such as walking, running, turning around, grooming, lying down and getting up without strain or difficulty.
- Have a comfortable, dry, bedded area in which to lie, for example, straw.
- Have suitable roughage added to their diet from the age of two weeks to allow for normal rumen development and ruminating behaviour
- Have sufficient iron in their diets to maintain full health and vigour.

Appendix 1 - Legislation

European Community

Council Directive 97/2/EC of 20 January 1997 lays down minimum standards for the protection of calves:

- It is prohibited to house calves in individual pens or boxes after the age of eight weeks, except when necessary for veterinary treatment.
- The width of any individual calf pen shall be at least equal to the height of the calf at the withers, measured in the standing position, and the length shall be at least equal to the body length of the calf measured from the tip of the nose to the caudal edge of the tuber ischii (pin bone), multiplied by 1.1 *This formula enables the calf to turn around.*
- Individual pens for calves used up to the age of eight weeks must not have solid walls, but perforated walls to allow calves to have direct visual and tactile contact with other calves.
- For calves kept in groups, each calf shall have an unobstructed space allowance of 1.5 sq m (1.8 sq yd) for each calf with a live weight of less than 150 kilograms (330lb); at least equal to 1.7sq m (2.04 sq yd) for each calf with a live weight of 150 kilograms (330lb) or more but less than 220 kilograms (484lb), and at least equal to 1.8sq m (2.16 sq yd) for each calf with a live weight of 220 kilograms (484lb) or more.

These provisions came into affect from 1 Jan 1998 for new or rebuilt units and must be complied with by 31 December 2006 by all holdings.

Commission Decision 97/182/EC of 24 February 1997 lays down additional requirements:

- Calves may not be tethered except for one hour at feeding time in the case of group-housed animals.
- The accommodation must be constructed in such a way as to allow each calf to lie down, rest, stand up and groom itself without difficulty.
- All calves shall be provided with an appropriate diet adapted to their age, weight, behavioural and physiological needs, to promote good health and welfare. Their food shall contain sufficient iron to ensure an average blood haemoglobin level of at least 4.5 mmol/litre and a minimum daily ration of fibrous food shall be provided for each calf over two weeks old, the quantity being raised from 50g (2oz) to 250g (10oz) a day for calves from eight to 20 weeks old.
- Calves must receive colostrum within the first six hours of life.

- In hot weather conditions or for calves that are ill, fresh drinking water shall be available at all times.

UK

Veal crates have been banned in the UK since 1990. UK legislation goes beyond the EU requirements, for example, larger space allowances for group-housed veal production and requiring bedding. The current legislation governing group-housed veal production is the Welfare of Farmed Animals (England) Regulations 2000:

- For calves kept in groups, the space allowance available shall be at least 1.5 square metres (1.8 sq yd) for each calf with a live weight of less than 150 kg (330lb), at least 2 square metres (2.4 sq yd) for each calf with a live weight of 150 kg (330lb) or more but less than 200 kg (440lb), and at least 3 square metres (3.6 sq yd) for each calf with a live weight of 200 kg (440lb) or more.
- All calves shall be provided with appropriate bedding.
- Daily ration of fibrous food for every calf over 2 weeks old – minimum of 100g (4 oz) at 2 weeks old to a minimum of 250 g (10oz) at 20 weeks old.

Appendix 11 – Welfare Standards

The Dutch Group-housed Producert Standard

Some 15 years ago the Dutch SPCA supported a group-housed system for veal calf production and a standard was developed. The 1997 EU Directive requirements are almost identical to Dutch group-housing systems. Farmers complying with the Producert certification scheme, for example, will not have to make any changes to meet the legislation. To receive Producert accreditation, the following requirements must be met: -

- Calves should receive roughage from one week after arrival in the group house system. Over the total fattening period they shall receive an average of 1 kg (2.2lb) a day of roughage.
- During the full fattening period iron levels should be an average of 8.5g/dl (approx 5.54 mmol/l) For individual calves it should be 8 g/dl (approx 4.9mmol/l)
- Space allowance for calves complies with the EU Directive, the calves all have at least 1.8 sq m (2.16 sq yd) from start to finish.
- Groups should consist of at least four animals.
- Farms must be inspected four times a year.

RSPCA Welfare Standards for Freedom Food

Freedom Food is an independent organisation established by the RSPCA that offers a label to eggs, meat and dairy products that have been produced to standards set and monitored by the RSPCA. The standards relating to veal production go further than both UK and EU legislation:

- Starter roughage for calves must be unchopped meadow hay or unchopped barley or wheat straw. The objective should be to encourage rumen development using long fibre.
- The iron content in the diet must be sufficient to maintain a minimum blood haemoglobin level of 5.6 mmol/l.
- Cattle including calves over 7 days must be provided with continuous access to an adequate supply of clean, fresh drinking water each day, except when required by attending veterinary surgeon.
- The floor must not be slatted. Deep wheat/barley straw bedding must be provided and topped up daily. A fall on the floor of 1 in 20 minimum must be provided to facilitate drainage.

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