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**Development of a Strategic Approach for a Single
EU Beef Market
Extensification
An Analysis of National and Competitive Issues**

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Irish Agriculture and Food Development Authority	Rural Economy Research Centre Ionad Taighde Eacnamaíochta Tuatha

Executive Summary

The concept of extensification was introduced as part of the switch-over to the direct payment (DP) system of income support under the MacSharry reforms of the beef regime in 1992. The purpose was to encourage extensive production methods and reduce the supply of beef.

The annual revenue from extensification received by Irish cattle farmers in 1999 was £80 million. A similar amount was received in 1998. This is equivalent to a price increase of about 14 pence per kilo carcass weight when allocated to all Irish beef production. If it is allocated only to beef produced from the animals eligible for extensification as currently administered, namely, males and cull suckler cows, the price equivalent per kilo is of the order of 25 pence.

The extensification premium (EP) under the MacSharry reforms operated as a “top-up” on the **formal applications for** the suckler cow (SCP) and the special beef (SBP) premiums. The extensification premium was payable on farms when the **eligible animals** for which application was made were **collectively stocked** at less than 1.4 livestock units (LU) per forage hectare. Under the Agenda 2000 Agreement significant changes in the operation of the system were introduced. Under this agreement **all** animals, whether eligible for the premium or not, must be included in the stocking density calculations and heifers, as per the regulations, have the same LU weightings as male animals of the same age.

Assuming that the national land base available for beef production remains largely constant, then the inclusion of extra animals in the livestock unit calculations under Agenda 2000 could have a significant effect on stocking densities and the resulting ability to secure revenue from extensification payments. Other studies have shown that direct payments, including extensification, are now almost the complete income for Irish cattle farmers. Therefore the compliance criteria for DPs including extensification impact significantly on the economics and operation of production systems. Because of the growing importance of DPs, including extensification, the primary focus of cattle farmers has increasingly shifted from the consumer of beef towards the:

- compliance criteria for the DPs and
- containment of production costs within the constraints of the DP compliance criteria.

The extensification options

The stocking density calculations are most acute in relation to extensification as the eligibility for this premium relates to the entire herd and not just to individual animals. Under the Agenda 2000 agreement, all animals are included in the stocking density calculations. Member States were offered a choice of extensification systems with varying rates of premiums. These are:

- **Option 1:** a single payment of £79 per Special Beef Premium (SBP) and Suckler Cow Premium (SCP) collected provided a stocking density limit of 1.4 LU per hectare is met

OR

- **Option 2:** with two levels of payment depending on the stocking density
£63 at < 1.4 LU per hectare
£31.50 between 1.4 and 1.8 LU per hectare.

The incentive to extensify production methods under Option 1 is very high, as the EP top-up has increased to almost 50 percent of the value of the SCP per LU for suckler cows and bulls, and to 67 percent of the value of the SBP per LU for steers. These percentages are over twice what they were under the MacSharry system. Even under Option 2, the incentive is increased significantly where animals are stocked at less than 1.4 LU/ha as the top-up ranges from 36 to 53 percent depending on the type of animal. But for animals on farms with a stocking rate in the 1.4 to 1.8 range, the incentive to extensify is relatively small at between 18 and 27 percent. This is even less than existed on farms that secured extensification under the MacSharry system.

Stocking density calculations

Earlier studies have shown that under the MacSharry reforms, Ireland has been much more efficient than other member states at “drawing down” both the SBP and extensification. This arises due to the extensive nature of the beef production systems used in Ireland. In this study the implications of including heifers in the stocking density calculations under Agenda 2000 was evaluated. Assuming the land base for cattle production remains constant, estimates indicate that the inclusion of heifers increases the LUs and stocking density by 44% for the EU-15 but only by 34% for Ireland. For the individual Member States, the increase ranges from 22% for Greece to 61% for Luxembourg. The main conclusion from an Irish perspective is that the inclusion of heifers will have a greater negative impact on the access to extensification for all the other beef producing countries, with the exception of Spain, Portugal and Greece.

The capacity of each country to adjust cattle numbers and cohorts to achieve the stocking density requirements for extensification under Agenda 2000 was evaluated. The animals most likely to be eliminated would be those not eligible for DPs, like heifers and surplus cows. The removal of cows is the most effective mechanism for reducing animal numbers as the potential progeny are also eliminated. Estimates show that the removal of a cow effectively removes 1.9 LUs in the EU15, but the values range from a high of 2.32 for Ireland to 1.37 for Spain. Consequently, the removal of “surplus cows” would have a very large impact in making ‘room’ to acquire more extensification revenue in Ireland.

Estimates show that when heifers are included in the calculations and the stocking density limit is retained at 1.4, Ireland would have to reduce its cow herd by 10 to 14 percent to maintain the same level of access to EPs, in terms of animal numbers. These adjustments are based on a 20 percent cow replacement rate that are more typical of other Member States. When allowance is made for the more normal dairy and beef cow replacement rate in Ireland, about 17 and 12 percent respectively, reductions of the order of 6 and 10 percent respectively in the cow herds would probably suffice. The impact on all other member states would be much greater as they would have to remove two to four times more of their cow herd to reach the same target of 1.4.

With the removal of this number of cows, many Member States; namely Greece, Spain, Austria, Finland Sweden and Denmark, would not have sufficient cows, two cows per SBP, to produce the required number of male animals to “draw-down” their quota of SBP. These countries would therefore be trading off SBPs against extensification if they were to try to maintain the MacSharry level of access to extensification. The ratio for Ireland

would also be restrictive, especially when allowances are made for the calving percentage but this problem would also be reduced, but not eliminated, due to the lower cow replacement rate in Ireland.

The inclusion of heifers in the stocking rate calculations would cause very little adjustment problems for Ireland if the stocking density limit was set at 1.8. But if Ireland were to avail of this limit, it would draw a very high proportion of the animals and the cattle farms into the administrative ambit of the extensification system. This would greatly increase the administrative stranglehold on cattle production in Ireland and also impact severely on other farm enterprises.

Estimates indicate that the 1.8 limit would also cause significant constraints for all other Member States apart from Greece, Portugal and Spain. The UK, France and Belgium could exploit the option of using the replacement heifers for SCP to minimise, but not eliminate, the need to shed dairy cows to maintain access to extensification.

Economics of extensification

The economic merits of the two Options for extensification under Agenda 2000 were evaluated in relation to their ability to generate revenue and their impact on the competitiveness of Irish cattle farming. Under extensification Options 1 and 2 respectively, Ireland could receive a maximum £257 million or £205 million in extensification revenue if all the appropriate animals were stocked on farms at less than 1.4 LU. Option 1 would give the highest revenue if a high percentage of SCP and SBP animals were stocked at less than 1.4, but the lower the percentage of eligible animals in this category the greater the benefit from using Option 2.

It is estimated that Ireland would do better under Option 2 when less than 66 percent of the animals are stocked on farms at a stocking rate of under 1.4, but all eligible animals would have to collect extensification at either the 1.4 or 1.8 level of stocking density. Option 1 is best if more than 66 percent of the animals were stocked on farms with a stocking density of less than 1.4 LUs when they claimed their SCP or the SBP. In this situation, option 1 would provide the added advantage that the remaining animals, up to 34 per cent, and the farms on which they reside, could operate outside the administrative and stocking density compliance constraints of the extensification system.

At the 'break-even' point of 66 percent Ireland would collect £170 million. This could be achieved either by collecting £79/head on 66 percent of animals under Option 1 or alternatively, under Option 2, by a combination of £63/head on 66 percent of animals and £31.50/head on the remaining 34 percent of animals. However, the 'break-even' point declines rapidly if a significant proportion of the animals under Option 2 fail to collect even the £31.50 extensification premium, payable for animals with a stocking density between 1.4 and 1.8. For example, the 'break-even' point between the options declines to almost 50 percent in the event of 20 or more percent of the animals failing to collect the £31.50 extensification premium and the total revenue declines to £137 million.

For a range of practical reasons, there will be some slippage in the ability to collect the maximum number of extensification premiums. For example, the degree of slippage could be related to the ease of compliance with the administrative criteria for the DPs and

significance of the DPs, including extensification, in the margins and incomes of the farmers concerned. Earlier work has demonstrated that the DPs account for most of the margins and incomes of Irish cattle farmers. With shrinking market-based margins under Agenda 2000, the degree of slippage should be relatively low for the basic SCP and SBP. But given the administrative complexity of the extensification system itself, with its separate method of estimating stocking densities, some slippage would seem inevitable with the EPs.

In contrast to Ireland, cattle farmers in other EU countries were shown to be less dependent on DPs as they obtained higher prices for beef and the market-based margin comprised a greater proportion of their total margin. However this position will be more difficult to maintain under Agenda 2000 as beef prices decline and the value of the DPs increase. These contrasting revenue structures have significant implications for the competitiveness of Irish beef.

Selecting the best extensification option

Two of the main factors in determining the best extensification option for Ireland are:

- the relative ability of the options to deliver revenue from extensification, and
- the implications of the chosen options for inter-country competitiveness for beef production.

An analysis of the situation in Ireland concluded that when a range of factors are taken into account it is likely that extensification at the 1.4 limit will be collected on:

- almost all of the SCPs, and
- most of the 9 month SBP for male weanlings from the suckler herd, and
- some of the 22 month SBP, with the exact proportion dependent on the level and structure of the live export trade

If the export trade in weanlings continues, many SBP animals may have exited the country before they collect the 2nd SBP. Therefore, a very high proportion (over 66 percent) of the SCPs and the SBP animals derived from the suckler herd would collect extensification at the 1.4 limit. It is probable therefore that farmers with suckler herds would benefit most if extensification Option 1 were selected.

A similar situation will probably prevail on dairy farms with relatively low stocking densities. These could trade heifers and young male animals strategically to ensure that the stocking densities will be less than 1.4LU. The more heavily stocked dairy farms are most likely to have a problem with SBP animals stocked at the 1.4 limit. A small but significant realignment of the calf and young cattle trading patterns on these farms could achieve the desired result. For example, the more intensive dairy farms could specialise in rearing calves but sell the male animals before the 1st SBP was collected and indirectly benefit through the selling price from the value of the SBP.

These intensive farms could also specialise in fattening non-DP animals and in finishing beef cattle that have already collected their DPs elsewhere. This way they would avoid the production constraints and the entire bureaucracy of the cattle DP system.

Maximising revenue

When all factors are considered, it is probable that Ireland would benefit most from the Option 1 extensification system. Option 1 would:

- yield the highest revenue for the country
- target a higher portion of the revenue towards the supply of cattle from the suckler herd which are of a higher quality relative to cattle from the dairy herd
- target more of the revenue towards the poorer regions of the country where extensive production systems are already used
- release the larger dairy farms and market oriented cattle fattening farms from the stocking density requirement and the administrative bureaucracy associated with the DPs and extensification
- best facilitate the production of quality finished animals for the higher priced beef markets within the EU.

In any event, even under Option 2, an increasing number of cattle farmers will aim for the 1.4 limit to get the higher of the two extensification premiums available. The incentive to do this will increase as:

- calves become scarce and expensive as cow numbers decline in response to milk and suckler cow quota limits
- the price of beef declines
- more farmers opt to join REPS, with its associated compliance criteria
- more farmers secure off-farm employment which will lead to less labour intensive and operationally simpler cattle production systems.

Competitiveness

As noted earlier, any incremental relaxation of the stocking density requirements would allow more animals in every country to secure extensification. But there is also a significant competitiveness dimension to such changes. Most Member States, apart from Ireland, already have limited access to EPs and it would appear that extending the stocking density to 1.8 could be of greater advantage to them than it would to Ireland which is already much closer to its maximum 'take' of extensification revenue. While obtaining some extra revenue by opting for the 1.8 limit Ireland would be compromising part of its competitiveness, in the sense of allowing a significant number of non-Irish producers to receive higher margins with consequent possible supply increase. As a residual supplier Ireland is particularly vulnerable in its beef prices in an oversupplied market.

This situation is further accentuated when the differences in the dependence of Member States on market based margins for their incomes from cattle production is taken into account. Ireland, due to relatively low beef prices and better access to DPs is less dependent on the market based margins. Therefore, unless there is a further divergence in the beef prices between Member States under Agenda 2000, the economics of beef production in Ireland will be less sensitive to the decline in beef prices that will likely

arise due to the reduction in EU price supports.

Should beef prices decline, the greatest economic impact will be on intensive production systems with stocking densities in the region of 1.6 to 2.0. If this persisted it would discourage production and supplies from these intensive systems and would result in a better overall market balance for beef in the EU. This would facilitate and encourage price convergence within the EU and it would be a major advantage for Ireland as this country is generally considered to be a residual supplier. In this scenario, Ireland would have the twin advantages of both beef price convergence and very high access to DPs, especially extensification. Furthermore, future beef supplies would effectively be controlled by the low market based margins throughout the EU and the quota system of SCPs and SBPs for individual Member States. This would add further stability to the incomes of Irish cattle farmers.

To reach this situation Ireland would have to shed animals surplus to quota requirements for milk, SCP and SBP but nevertheless, the required adjustments are modest compared to other countries. With the decline in the Irish cattle herd in 1999, most of the required destocking has already taken place and further adjustments would be feasible especially if accompanied by a re-alignment of cattle trading and production patterns as outlined above. If these adjustments were made, it is probable that up to 70 percent of the Suckler cows and a somewhat smaller percentage of the SBPs would collect extensification payments under Option 1.

The impact on all other member states would be much greater as they would have to remove two to four times more of their cow herd to reach the same target of 1.4. This investigation showed that if the relevant adjustments were made, many Member States; namely Greece, Spain, Austria, Finland Sweden and Denmark, would not have sufficient cows, i.e. two cows per SBP, to produce the required number of male animals to draw-down their full quota of SBPs. These countries would therefore be trading off SBPs against extensification if they were to try to maintain the MacSharry level of access to extensification under option 1. As cattle producers in most of the EU countries are more dependent than Ireland on the market based margins, reflecting higher cattle prices, the incentive to reduce cow numbers to achieve extensification would also be lower.

In conclusion, Ireland may be the only country in the EU that would benefit from using Option 1. Undoubtedly, more Irish farmers and animals would collect extensification under Option 2 but:

- the overall revenue is likely to be lower
- the revenue would be more poorly targeted in terms of income support
- the reward for product quality would be lower (containing more cattle from the dairy herd)
- the administration of the extensification system would be more invasive for cattle, sheep, dairying and possibly for cereal producers, and
- the competitiveness of Irish beef production within the EU would decline.

Since Option 2 is now available it will allow Ireland's competitors further access to EPs. This extra access, even to the lower valued EPs, will be of increasing significance as the price of beef declines as envisaged under Agenda 2000. Should Ireland's competitors

become even more successful in capturing EPs, there is also the added complication of the “administrative cap” on the EU budget available for extensification. If in the future, the budget is exceeded it is probable that the value of the individual EPs will be scaled back *pro rata*. This would certainly not suit Ireland, as it would effectively mean a scaling back of EPs in Ireland to finance the EPs for competitors in other countries.

A feature of Option 2 is its ability to suck-in almost all the farms with stocking densities in the 1.6 to 2.0 range but yet deliver relatively small economic benefits from extensification. Consequently, the compliance criteria for extensification have a significant effect on almost the entire Irish cattle herd and for other enterprises such as dairying, cereals and sheep.

Both Options use the 1.4 limit, but payment rate is £79 under Option 1 compared to £63 under Option 2. Therefore, most farmers with stocking rates near the 1.4 limit will aim at this figure irrespective of the Option selected Nationally. The logic of the 1.8 limit available under Option 2 is difficult to understand. The methods of computing stocking densities for EPs and the basic SCPs and SBPs are different. However, animals aimed at the 1.8 limit can scarcely be doing much to achieve extensification if all the animals that receive the basic SCP and SBP must first be stocked at less than 2.0 LU. The combination of the 2.0 limit for eligibility for the basic premium and the 1.8 limit for extensification, could imply that animals are considered to be stocked extensively even if the actual stocking density is as high as 90 percent of maximum limit of 2.0 allowed for basic premium purposes. $(1.8/2.0 \times 100)$. The 1.8 limit could achieve a significant extensification effect only if a very high percentage of the eligible animals in the EU were concentrated on farms within the extremely narrow stocking rate band of 1.8 to 2.0, which seems improbable.

On the other hand it may simply be considered desirable that a very high proportion of the eligible animals in the EU should receive an extensification premium. If this is the case, then, given the administratively invasive nature of the 1.8 limit, it would have been preferable if the related £31.5 extensification premium was administered by increasing the value of the basic SCPs and SBPs by the equivalent amount. But, then the payment could not be classified as an incentive to extensify.

The economics of extensification are increasingly dependent on the relative scarcity of eligible animals and land. As the price of beef declines and the value of the DPs increase, much of the value of the DPs becomes capitalised into the factors specified in the compliance criteria, namely eligible animals and land. This progressively pushes out the non-eligible or non-DP animals (cows surplus to quotas, heifers, male animals that have already collected their SBPs, lambs over 6 months), and low-DP animals (non-replacement beef heifers).

The number of eligible animals will also decline as the market-based margin shrinks, and perhaps even becomes negative. This may occur because of falling beef prices and rising costs. The rise in costs in turn is both driven by the capitalisation process and accentuated by it. Trying to maintain farm incomes by increasing the value of the EPs, which are also tied to the shrinking pool of eligible animals further increases this capitalisation process on the animals.

FOREWORD

The inherent nature of cattle farming with its long production cycle makes it difficult to control and predict beef supplies and prices. In Ireland, these inherent characteristics are further complicated by being heavily influenced by EU beef policy in relation to income support and export trading conditions. Major EU policy changes over the last twenty years have affected the export competitiveness of Irish beef. The WTO agreement in 1994 and the more recent international financial crises, especially in Russia, have severely constrained Irish beef exports to traditional and evolving markets in third countries. Various food safety issues, in particular the BSE crisis, have further accentuated the market imbalance in the EU. The decline in consumption combined with the re-nationalised EU beef market has impacted most severely on Irish beef.

Teagasc, in conjunction with University College Dublin, has initiated research to establish how Ireland could develop a more strategic approach to the evolution of a single EU beef market. A number of joint working papers have been prepared on various aspects of EU policy for beef and their implications for cattle prices, direct payments and farm income in Ireland. To facilitate public discussion on these very important topics it has been decided to publish these working papers. The authors of the working papers invite comments and observations on their analysis and conclusions.

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Development of a Strategic Approach for a Single EU Beef Market

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Extensification

An Analysis of National and Competitive Issues

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The concept of extensification was introduced as part of the switch-over to the direct payment (DPs) system of income support under the MacSharry reforms of the beef regime in 1992. The purpose was to encourage extensive production methods and reduce the supply of beef.

The increasing importance of the DPs as a form of revenue for Irish cattle farmers was demonstrated in working paper No. 4. In working paper No. 5 it was shown that cattle farmers in Ireland have become more and more reliant on DPs for their margins and income. Other research has demonstrated that direct payments are already a major component of the margins in cattle production and they have also provided a major stabilising influence on margins and incomes for cattle farmers in recent years (Dunne 1998a and 1999a).

Under Agenda 2000 it is envisaged that there will be a further reduction in the price of beef and a related increase in the value of the direct payments. In this situation the value of the direct payments could even exceed the total margin from cattle production on many Irish farms i.e. some of the direct payment is used to pay production costs. This situation has already been reached for the Irish beef sector in its entirety (Dunne 2000). Therefore, the ability to access the direct payments, including extensification, is of increasing importance to the economic viability of cattle farmers.

The total annual revenue from extensification received by Irish cattle farmers in 1998 and 1999 was about £80 million. This is equivalent to a price increase of about 14 pence per kilo carcass weight for all beef produced. If this revenue is compared with the beef produced by the animals eligible for extensification as currently administered, males and cull suckler cows, the price equivalent per kilo would be of the order of 25 pence.

Because of the growing importance of DPs, including extensification, the primary focus of cattle farmers has shifted from the beef consumer towards:

- the compliance criteria for the DPs, and
- the containment of production costs within the constraints of the DP compliance criteria.

Stocking density is the major compliance requirement in addition to the need to possess "eligible" animals. The stocking density requirement is most acute in relation to a farmer's entitlement to extensification.

This paper focuses on how the stocking criteria for extensification impact on:

- inter-country competitiveness in beef
- the optimum stocking density limits for Irish cattle farmers
- the structure of the various cattle cohorts in Ireland
- the marginal cost of retaining certain animals on farms seeking extensification
- the marginal value of land on farms seeking extensification
- the incentive to trade animals between farms
- the likely producer response to changes in the stocking density criteria.

Stocking Density

The extensification premium (EP) under the MacSharry reforms operated as a “top-up” on the **applications for** the suckler cow (SCP) and the special beef (SBP) premiums. The extensification payment was payable on farms when the eligible animals applied for were **collectively stocked** at less than 1.4 livestock units (LU) per hectare. Following the BSE problems in 1996, an even larger extensification premium was introduced for farms where the stocking density was less than 1 LU. This latter development is of limited interest in Ireland and it is ignored in this report to reduce the complexity of the analysis.

In calculating the stocking density for beef cattle under the MacSharry reform, the area devoted to cattle production was determined as the total area farmed less that used for other enterprises like tillage, sheep and milk. Unlike the common farm management practice, there is no adjustment for land quality in the calculations of stocking densities for extensification.

The LU calculations for extensification under the MacSharry system were based on the animals used in the applications for SCPs and SBPs and their age at that time of the application. These were converted into LUs using the following coefficients:

- male animals over 6 months but under two years are rated at 0.6 LUs
- male animals over two years and suckler cows are weighted at 1 LU.

In this system there could have been a significant number of “hidden LUs” on many of the farms that qualified for extensification payments. These could have included:

- animals under 6 months did not feature in the stocking density calculations
- male cattle that had already collected their premium (SBP) on other farms
- eligible (SBP) male animals which might be sold to other farmers before their eligibility expired but these could collect the premium on the farm of purchase
- cows in excess of quotas for both milk and SCP
- all heifers, since these were not eligible for premiums and were also excluded from the LU calculations.
- ewes in excess of ewe premium quotas
- all other sheep.

Under the Agenda 2000 Agreement significant changes in the operation of the system were introduced. Under this agreement all cattle and sheep must be included in the stocking density calculations and heifers have the same LU weightings as male animals of the same age. Assuming that the land base available for beef production remains largely constant, the inclusion of these extra animals in the livestock unit calculations

could have a significant effect on stocking densities and the ability to secure extensification payments.

The current weightings for the different animals and the main criteria used for calculating the stocking densities for extensification are summarised in Table 1. Unlike the MacSharry reforms, the aim under Agenda 2000 is to include all animals in the calculations. This will eventually be achieved by using the animal register for each farm, which records all births, deaths, sales and purchases. The future plan is that the relevant information will be available via the electronic database from the Cattle Movement Monitoring System (CMMS) being developed by the Department of Agriculture, Food and Rural Development.

Table 1: Extensification Premiums and Livestock Units

Extensification		MacSharry		Agenda 2000	
Animal Type	Premium payable	Animals included	Weighting LU	Animals Included	Weighting LU
Dairy cows	No	quota or all	1.0	All	1.0
Beef cows	Yes	only, SCP applications	1.0	All	1.0
Replacement heifer (suckler herd)	yes, under Agenda 2000	Zero	0	up to 20% of SCP applications	0.6 if < 24 months and not calved
Male > 24 months	Yes	only, SBP applications	1.0	All	1.0
Male 6 to 24 months	Yes	only, SBP applications	0.6	All	0.6
Female > 24 months	No	Zero	0	All	1.0
Female 6 to 24 months	No	Zero	0	All	0.6
Male and female < 6 months	No	Zero	0	Zero	0
Ewes	No	only, ewe premium applications	0.15	only, ewe premium applications	0.15
Lambs	No	Zero	0	Zero	0

Notes: SCP = suckler cow premium

SBP = special beef premium, payable on male (steer) beef animals at 10 and 22 months under MacSharry but under agenda 2000 the age is reduced by one month to 9 and 21 months.

Until the complete register is available, a series of five censuses per year will be taken on each farm and this will be used to estimate the LUs for extensification payment purposes. Because the census relates to five specific dates which are not known in

advance it may be very difficult for the farmers to accurately plan their production systems, livestock numbers and their eligibility for extensification payments. Since the revenue involved is substantial, the interim system with its *post hoc* census dates could easily precipitate panic sales and trading in cattle towards the end of the year when farmers are in a better position to establish their actual stocking densities relative to their requirements for extensification.

The overall impact could be a further increase in inter-farm trading of animals, as cattle farmers respond to their stocking density situation. Some of this extra trading and the possible panic selling could be avoided if the census dates were fixed in advance and better forward planning could prevail. As far as the individual farmer's entitlements to extensification payments are concerned, it probably matters little whether the cattle are traded to comply with pre-planned or post hoc census dates but panic trading could be avoided with the pre planned dates. Fortunately, pre planning will become easier once the CMMS data base, becomes operable and all the days of the year will be used for calculating the stocking density and not just the *post hoc* census dates. Then, farmers will be better able to manage their herds to optimise their entitlements and incomes.

Because the direct payments, including extensification, are now almost the complete income for Irish cattle farmers, the related compliance criteria severely compromises the economics of production systems (see working paper No. 5). The stocking density calculations are most acute in relation to extensification where the premium relates to the entire herd and not just to individual animals.

Premium rates

As already noted, the extensification premium (EP) operates as a "top-up" on the applications for the suckler cow (SCP) and the special beef (SBP) premiums and under MacSharry reforms the EP was payable on farms when *these animals were collectively stocked* at less than 1.4 livestock units (LU) per hectare. Following the BSE problems in 1996, an even larger extensification premium was introduced for farms where the stocking density was less than 1 LU. This latter development is of limited interest in Ireland and it is ignored in this report to reduce the complexity of the analysis. Also in 1996, a separate SBP system at a higher premium rate was introduced for Bulls, but only one bull premium could be collected during the animal's life as compared to the two SBPs for steers. This was also of limited relevance to Ireland.

Under the Agenda 2000 agreement all animals are included in the stocking density calculations, as outlined in Table 1. Also under the agreement, Member States were offered the choice of extensification systems with varying rates of premiums:

- **Option 1:** a single payment of £79 with a stocking density limit of <1.4 LU
- OR
- **Option 2:** with two levels of payment depending on the stocking density
 - £63 at < 1.4 LU
 - £31.50 between 1.4 and 1.8 LU

Since the EP is essentially a "top-up" payment on the basic SBP and SCP when the appropriate stocking density limits are achieved, the ability to collect as many SBPs and SCPs as possible is prerequisite to maximising extensification revenue. Maximising EP

revenue depends on the size of EP itself, and the stocking rate adjustment needed to comply with the standard. The stocking rate adjustment calculations are in turn influenced by the stocking density weightings for the animals involved as specified in the legislation, (see Table 1).

On farms where stocking rates are critical for access to EP, it should be possible to collect the SBP while the male animals are under 2 years and therefore rated as 0.6LU. This gives male animals a considerable advantage over suckler cows as these are always rated as 1.0 LU. The exception here is the use of the maiden heifer facility to collect up to 20 percent of the SCPs. If the heifers are under two years at the time of application for the SCP they are rated at 0.6 LU. But, once they produce a calf, even if they are less than 24 months old, they are rated at 1.0 LU.

It is noteworthy that the EP top-up is on the basic SCP or SBP and these are paid out on eligible animal applications for these premiums. But, access to the EP depends on the stocking density on the farm as an entire unit as measured from the cattle register for each farm at the five census dates, or, in the future by the annual average from the Department's data base for each day of the year. Therefore, a farmer in seeking to gain access to extensification must optimise the stocking densities by having regard to the weightings of the animal cohorts at **both**:

- the time of application for the basic premiums (SCP or SBP), **and**
- the appropriate (EP) census dates throughout the year.

If the applications for the basic SBP takes place once the animals reach the appropriate age the main restriction for extensification is likely to be the age and LU weightings at census dates. The presence of heifers, and to a lesser extent cows and ewes surplus to the quotas, on the farm could be critical for access to extensification as the LUs of these animals are also taken into account.

The financial incentive of the top-up arising from the EP for suckler cows and male beef animals are summarised in Table 2. To allow for the different weightings for male beef animals and suckler cows the values for the EP are expressed both on a per animal and LU basis in Table 2.

Two options for the suckler cow are shown, the basic SCP and the additional national premium (NP) component which may be financed totally by the EU or by the National Government depending on the region concerned. To date the most relevant column for suckler cows in Ireland is the SCP + NP but the basic SCP is also presented to complete the picture. Similarly, the appropriate SBP data are presented for both steers and bulls. In practice, the most relevant options are: almost exclusively steers in Ireland and bulls for Continental countries.

Under the MacSharry system, the value of SCP per animal compares very favourably with the value of the SBP, even for bulls (Table 2). However when the value of these premiums are expressed on an LU basis the male animals under two years are a much more attractive mechanism for accessing DPs.

With the EPs, the rate per animal is the same for both suckler cows and male animals but the value of the EP per LU is much higher for male animals. The percentage top-up

arising from the EP varies from approximately 21 percent for suckler cows (SCP+NP) to 32 percent for SBP steers.

The narrowing of the difference in the value between the SCP and the SBP per animal under Agenda 2000 has further increased the differential per LU in favour of the male animals, especially for bulls. For animals farmed at low stocking densities (<1.4 LU/ha) there was also a two to three fold increase in the value of the EP.

Table 2 Premium rates

	SCP ¹	SCP+NP ²	SBP ³ steers	SBP ³ bulls
MacSharry (1992 to 1999)				
Basic premium (£/ animal)	114	133	86	106
Basic premium (£/ LU)	114	133	143	177
Extensification Premium (EP)				
@ < 1.4 LU/ha ⁴ (£/animal)	28	28	28	28
@ < 1.4 LU/ha (£/LU)	28	28	47	47
% “top up” on basic premium	24.6	21.1	32.3	26.4
Agenda 2000 (2002 to 2007)				
Basic premium £/animal	158	177	118	165
Basic premium £/LU	158	177	197	275
EP option 1				
@ < 1.4LU/ha (£/animal)	79	79	79	79
@ < 1.4 LU/ha (£/LU)	79	79	132	132
% “top up” on basic premium	50.0	44.6	66.9	47.9
EP option 2				
@ < 1.4 LU/ha (£/animal)	63	63	63	63
@ < 1.4 LU/ha (£/LU)	63	63	105	105
% “top up” on basic premium	39.9	35.6	53.3	38.2
@ 1.4 to 1.8 LU/ha (£/animal)	31.5	31.5	31.5	31.5
@ 1.4 to 1.8 LU/ha (£/LU)	31.5	31.5	53	53
% “top up” on basic premium	19.9	17.8	26.7	19.1

1 Suckler Cow Premium, basic

g Suckler Cow Premium including National top up

2 Special beef Premium

4 In 1996, a larger extensification premium was introduced where the stocking density was less than 1 LU. This is of limited interest in Ireland and it is ignored in this report to reduce the complexity of the analysis

The incentive to extensify production under option 1 is very high as the EP top-up has increased to almost 50 percent of SCP/LU for suckler cows and bulls and to 67 percent of SBP/LU for steers. Even under option 2, the incentive is increased significantly where animals are stocked at less than 1.4 LU/ha as the top-up ranges from 36 to 53 percent depending on the type of animal. But for animals on farms with a stocking rate of 1.4 to 1.8 the incentive to extensify is relatively small, between 18 and 27 percent, which is even less than existed on farms that secured extensification under the MacSharry system

Extensification under the MacSharry Reforms

Under the MacSharry reforms, Ireland has been much more efficient than other member states at “drawing down” the SBP and extensification payments (Dunne 1997, O’Connell *et al* 1999). This arises due to the nature of the beef production systems used. Dunne (1997) demonstrated that over 80% of Irish male cattle collect the 22 month special beef premium (SBP22) while producers in most of the EU obtain this premium on less than 40% of male cattle. Even in the UK, with similar beef systems to those in Ireland, producers were found to collect premia on only 61% of male cattle.

In relation to extensification, Dunne (1997) also demonstrated that the capacity to avail of the top-up itself was also highest in Ireland where over 70% of the SBP and almost 90% of the SCP animals collected this premium. The ability to claim extensification on the basic SBP in the UK and France was about 90% that for Ireland but in many of the other member states it was only about 30%. The ability to claim extensification on SCPs was almost as high in both France and the UK as it was in Ireland but in Germany it was less than 70% of the Irish rate.

These findings have fundamental implications in relation to any adjustments to the stocking rate requirements for extensification. From a statistical perspective, any incremental relaxation of the stocking density requirements will allow more animals in every country to secure the premium. There is, however, a competitiveness dimension to such changes. If the incremental change relates to the top end of a declining curve or the last few percent of the animals, as in Ireland, then the proportionate gain is relatively small. But if the incremental change relates to the bottom end of a rising curve, as in Member States that already have limited access to EPs, then the proportionate gain can be substantial. Since the actual shape of the stocking density curve for each Member State is not available it is not possible to provide accurate estimates of the changes in competitiveness arising from an incremental change in the stocking density requirements. Nevertheless, the differences between the Member States can be taken into account in evaluating proposed changes in the compliance standards. For example, the simple objective of aiming to obtain EPs on all animals while desirable in itself may not be the best long term option for Ireland.

Extensification under Agenda 2000

Assuming that the land base devoted to cattle production remains approximately the same under Agenda 2000, the ability to collect extensification should decline when all animals are included in the LU calculations. It is difficult to make an accurate assessment of the likely impact of including all animals due to lack of data. The historical data on stocking density collected from the DP applications by individual farms under the operation of the MacSharry system is of limited use, even if it could be

accessed for each Member State. This arises because this data does not indicate the:

- degree to which individual farms in each country failed to qualify for extensification under the MacSharry criteria
- degree to which farmers omitted land parcels that were surplus to requirements to qualify for extensification at 1.4 LU per hectare
- degree of strategic purchases and sales of animals practised by farms close to the stocking density limits
- degree of un-exploited capacity arising from the stocking rate penalty of 0.4 LU arising from delay in applying for the SBP until the animal was over 2 years ($0.4 = 1.0 - 0.6$)
- degree of un-exploited capacity by farmers to adjust their production systems
- lack of data on the number of “hidden animals” of various types on individual farms in each member state (see page 2)
- degree to which the revenue from extensification payments could contribute to the overall margins derived from cattle production in each member state.

Inter-country Comparisons

While recognising that the premiums must be “drawn down” by specific animals on individual farms, it is possible by using census data to estimate the overall impact for each member state of including extra animals in the LU calculations. The main categories of extra animals included in the stocking densities under Agenda 2000 were outlined earlier in relation to Table 1. The most significant groupings were heifers, cows surplus to quota requirements and male animals over two that have already collected their DPs. It is assumed, for the purpose of this report at least, that for farms interested in extensification the male animals over two years will have either been sold onto farms not involved in extensification or slaughtered/exported.

It is possible to obtain estimates of the impact on stocking densities of the inclusion of heifers and surplus cows by using a combination of:

- the cattle census data for each country, and
- converting the animal numbers into LUs with both the MacSharry and Agenda 2000 premium livestock unit coefficients.

The resulting impact on stocking densities of including heifers is evaluated in this section based on the December 1997 cattle census data. Discussions relating to surplus cows are deferred to the next section under the title “adjusting to the new criteria”.

The consequences for the stocking densities for each Member State of including female animals are summarised in Table 3. The actual increases in LUs are presented in column (a) and the corresponding percentage increase is shown in column (b). These show that all countries are affected but to varying degrees.

Assuming the land base does not change, this data indicates that the inclusion of heifers increases the LUs and stocking density by 44% for the EU-15 but only by 34% for Ireland. For other countries, the increase ranges from 22% for Greece to 61% for Luxembourg. The main conclusion from an Irish perspective is that the inclusion of heifers will have a greater negative impact on the access to extensification for all the other beef producing countries, with the exception of Spain, Portugal and Greece.

To maintain the same degree of access to extensification in terms of cattle numbers receiving payment, under Agenda 2000 as existed under MacSharry, it is estimated that the stocking density limits would have to increase from 1.4 to the figures shown in column (c) of Table 3. For Ireland, the limit would need to increase to 1.9, but Greece, Portugal and Spain could accommodate a somewhat lower figure. In contrast, most of the other member states would require the limit to be set at 2.0 or higher (Table 3).

Table 3: The Inclusion of Heifers in Livestock Units

Country	Inclusion of Heifers @ 1.4 LU/hectare limit		Required limit ¹ LU/Ha (c)	Inclusion of Heifers @ 1.8 LU/hectare limit	
	LU increase (000) (a)	% increase (b)		Excess LU (000) (d)	Excess as % of Total LU (e)
Greece	74	22	1.7	-22	- 5
Portugal	204	25	1.7	-31	-3
Spain	831	26	1.8	-82	-2
Ireland	1405	34	1.9	218	4
Italy	1499	39	1.9	417	8
Austria	495	41	2.0	164	10
Finland	240	39	2.0	70	8
Sweden	409	45	2.0	170	13
UK	2786	46	2.0	1183	13
Germany	3858	49	2.1	307	19
Netherlands	957	49	2.1	459	16
France	5304	49	2.1	2587	16
Denmark	551	53	2.2	307	19
Belgium	852	60	2.2	553	24
Luxembourg	62	61	2.3	41	25
EU15	19529	44	2.0	7639	12

Source: Author's estimates based on 1997 cattle census data

¹ The estimated national stocking rate required to accommodate all heifers

In the Agenda 2000 proposals of March 1998, the stocking density limit was retained at 1.4 despite the requirement to include all animals in the calculations. But in the final agreement, in 1999, Member States were offered the choice of extensification systems:

- Option 1: a single payment of £79 with a stocking density limit of 1.4 LU
- OR
- Option 2: a system with two levels of payment depending on the stocking density
 - £63 at < 1.4 LU
 - £31.50 between 1.4 and 1.8 LU

For both options there was a phasing-in period of two years allowed, therefore, the complete new system would not be operable until 2002. For the purpose of this report the phasing-in period is ignored in the interest of simplicity and clarity.

The estimated impact of setting the stocking density limit at 1.8 can be seen in the last two columns of Table 3. These show that Greece, Portugal and Spain could actually increase their livestock numbers by 5, 3 and 2 percent respectively and yet draw down extensification payments on the same proportion of cattle which pertained under the MacSharry situation. Alternatively, they could maintain their livestock numbers but secure extensification payments on a higher proportion of their cattle. All other countries would have to reduce their overall LUs to be able to draw down extensification payments on the same proportion of cattle as obtained EPs under the MacSharry system. Of these, Ireland would only have to shed 4 percent of its total LUs (218,000 LUs), but the remaining countries would have to shed between 2 and 6 times this amount. Setting the limit at 1.8 would therefore provide some gain in competitiveness for Ireland in relation to access to extensification revenue. This is important especially when there is an overall EU budget limit on extensification payments.

Adjusting to the new criteria

If, under Agenda 2000, the objective was to maintain the degree of access to the same number of EP's as under MacSharry, then the number of LUs in most countries would have to be reduced. A strategic shedding of various types of animals in relation to their stocking density capacity to collect DPs could give the following 'shedding' scenario:

1. cows surplus to the quota requirements for milk and SCP.
2. heifers > 2 years and in excess of cow replacement requirements
3. males > 2 years that could have already collected their SBP
4. suckler cows within the SCP quota up to 20 percent of the quota, by availing of the 20 percent replacement heifer facility for the SCP.

The situation with heifers is rather complex as a number of premium situations can arise. Under Agenda 2000, there is the option of substituting replacement heifers for suckler cows, at a rate up to 20 percent, in the applications for SCP. Beef type heifers are eligible for a slaughter premium under the "national envelope" payment system but there is no stocking density requirement for this premium. In general, heifers do not collect DPs and consequently they are likely to be the most vulnerable, especially those over 2 years (equivalent to 1 LU) and not required as replacement heifers.

Males over 2 years, with a weighting of 1 LU, would also be vulnerable as these animals could already have collected the second SBP at 21 months under Agenda 2000. They could then be either moved onto farms not collecting extensification, slaughtered or exported live to other countries.

The removal of cows that are surplus to both milk and SCP quotas would have a large impact on LUs and stocking densities. The removal of a cow reduces the LUs not just by its own 1 LU but also the LUs associated with the potential progeny. This could be very significant, especially where long duration beef production systems are practised as in Ireland. The impact of removing cows is illustrated in Table 4 which shows the number of LUs per cow for each country under both the "MacSharry" and "Agenda 2000" criteria.

These estimates show that, under Agenda 2000, the removal of a cow effectively removes 1.9 LUs from the EU15 cattle herd, but the values range from a high of 2.32 for Ireland to 1.37 for Spain. Consequently, the removal of “surplus cows” would have a very large impact in making ‘room’ to acquire more extensification revenue in Ireland. In practice, the removal of cows would have a somewhat lower impact than the values presented in Table 4 because the least productive cows in terms of their ability to produce progeny would be removed first.

Table 4 Livestock Units per Cow

Country	LU per Cow (1)	
	“MacSharry” (Cows + Males) (2)	“Agenda 2000” (Cows + Males + Females) (2)
Greece	1.22	1.49
Portugal	1.27	1.58
Spain	1.09	1.37
Ireland	1.74	2.32
Italy	1.40	1.94
Austria	1.36	1.91
Finland	1.47	2.05
Sweden	1.45	2.10
UK	1.40	2.04
Germany	1.38	2.05
Netherlands	1.12	1.66
France	1.26	1.88
Denmark	1.27	1.95
Belgium	1.24	1.99
Luxembourg	1.31	2.11
EU15	1.33	1.92

Source: Author’s estimates based on 1997 cattle census data

(1) Estimated using LU coefficients as specified for premium purposes in Table 2.

(2) Over 6 months of age.

The Capacity to Adjust to the 1.4 Limit

The numbers of LUs that would have to be removed in each country to achieve the stocking rate target of 1.8 were shown in Table 3. Estimates were made of the types of animals and the extent to which they would have to be removed to achieve the 1.4 limit, the results are shown in Table 5 for two scenarios.

The data in column (a) and (c) are based on the assumption of an annual cow replacement rate of 20% for both dairy and beef cows. The second scenario, columns (b) and (d), shows the implications of a 20% replacement rate for dairy cows but with an apparent zero rate for beef cows. The apparent zero rate for beef cows represents the full exploitation of the 20% heifer facility for claiming the SCP which is available under Agenda 2000. In a biological and husbandry sense the beef cows are replaced at a 20% rate but this is done by substituting heifers up to the 20% limit of beef cow numbers as allowed for in SCP

applications.

To achieve the 1.4 limit it would be necessary for all countries to remove the following categories of animals:

- all heifers > 2 years (after allowing for cow replacements as outlined)
- all male animals > 2 years after they have collected the 2nd SBP
- suckler cows surplus to the quota requirements for SCP
- a percentage of the cows as shown in columns 2 and 3 of Table 5.

The data in Table 5 show that the cow herd in the EU15 would have to be reduced by 24 to 28 percent depending on the replacement strategy chosen. Ireland would have to reduce its total cow herd by 10 to 14 %, but the impact on all other member states would be much greater as they would have to remove two to four times this amount to reach the same target of 1.4 LU/ha.

Table 5: Animals removed to achieve the 1.4 limit

Country	Cows removed as % of		Remaining Cows per SBP Quota	
	Total cows (a)	Total Cows but using 20% replacement Heifers for SCP ¹ (b)	Total cows (c)	Total Cows but using 20% replacement Heifers for SCP ¹ (d)
Greece	32	37	0.88	0.97
Portugal	18	24	2.53	2.73
Spain	14	22	1.17	1.51
Ireland	10	14	1.92	2.01
Italy	23	26	2.86	2.98
Austria	34	37	1.21	1.26
Finland	35	36	1.03	1.04
Sweden	28	31	1.61	1.67
UK	24	29	2.16	2.29
Germany	31	33	2.09	2.13
Netherlands	37	38	2.58	2.64
France	21	26	3.22	3.47
Denmark	36	38	1.81	1.85
Belgium	24	28	2.79	3.01
Luxembourg	20	24	2.99	3.14
EU15	24	28	2.20	2.33

Source: Author's estimates based on 1997 cattle census data

¹Under Agenda 2000, there is the option of substituting replacement heifers for suckler cows, at a rate up to 20 percent, for SCP applications.

When cows are removed their potential progeny are also eliminated. If the reduction was large enough, there could be insufficient eligible male animals available to “draw down” the individual Member States full quota SBP and, the related extensification premium, if applicable, would also disappear. To evaluate this possibility, the estimated ratio of the “remaining” cow numbers to the SBP quota for each Member State is presented in the final two columns of Table 5.

In compiling these estimates, the cow numbers were first adjusted to take into account the significant number of young beef animals that are slaughtered as veal. These animals would therefore not collect the SBP in any event and they would also not affect stocking densities as they would be slaughtered under six months. It was assumed that the cows that produce the veal calves and the calves themselves would be farmed totally independent of the SBP and extensification system.

The estimates in Table 5 indicate that many Member States, (Greece, Spain, Austria, Finland Sweden and Denmark) would not have sufficient cows, two cows per SBP (on the basis of 50/50 male and female progeny), to produce the required number of male animals to draw-down their quota of SBP. The ratio for Ireland would also be restrictive, especially when allowances are made for the calving percentage. This would also mean that if Ireland was to fill its milk quota, the average milk yield for dairy cows would have to increase by in excess of 20 percent. This would require yields of over 1,000 or 1,100 gallons per cow depending on the beef cow replacement option chosen. This may be difficult but not impossible as most of the cows eliminated would be those with low yields which would quickly raise the average yield of the remainder. Also, the estimates for overall livestock numbers are based on a cow replacement rate of 20 percent, while this may be low for some countries it would be high for Ireland. A more typical replacement rate for a static dairy and beef cow herd in Ireland would be about 17 and 12 percent respectively. With such replacement rates, the removal of cows in Ireland as outlined in Table 5 could be scaled back to between 6 and 10 percent depending of the degree of use of the replacement heifer option chosen for the SCP. This would ensure that the overall cow numbers would be at least double the SBP quota.

In summary, Ireland would have to reduce its cow herd by 10 to 14 percent to maintain the same level of access to EPs, in terms of animal numbers, when heifers are included in the calculations and the stocking density limit is retained at 1.4. In practice, cow herd reductions of the order of 6 and 10 percent respectively would probably suffice when allowance is made for the more normal dairy and beef cow replacement rate of about 17 and 12 percent, respectively.

In any event, as the value of the DPs increase and the price of beef declines under Agenda 2000, there will inevitably be some restructuring of the cattle herd either through early slaughter or export of non-DP and low value-DP animals in Ireland. In addition, there is the possibility that under Agenda 2000, cattle farming will attract land out of both cereals and sheep enterprises but for different reasons (see Dunne 1999c).

The impact on all other member states would be much greater as they would have to remove two to four times more of their cow herd to reach the same target of 1.4. Many Member States; namely Greece, Spain, Austria, Finland, Sweden and Denmark, would not have sufficient cows, two cows per SBP, to produce the required number of male animals to draw-down their quota of SBP. These countries would therefore be trading off SBPs against extensification if they were to try to maintain the MacSharry level of access to extensification. The ratio for Ireland would also be restrictive, especially when allowances are made for the calving percentage but this problem would also be reduced, but not eliminated, due to the lower cow replacement rate in Ireland.

The Capacity to Adjust to the 1.8 Limit

The numbers of LUs that would have to be removed in each country to achieve the stocking rate targets of 1.8 were presented earlier in Table 3. Estimates of types of animals and the extent to which they would have to be removed to achieve the 1.8 limits are shown in Table 6. The estimates presented in Table 6 do not include the option to avail of the 20 percent heifer facility for claiming SCPs.

Since the number of LUs which have to be shed are much smaller than for the 1.4 limit, there can be a greater degree of selectivity of the types of animals shed. Greece, Portugal and Spain would already be within the limit and therefore no adjustment is required. Ireland has only a very small adjustment to make and this could be accommodated by shedding;

- all of the two year old heifers that are surplus to the 20 percent replacement rate, and
- 35 percent of the male animals that are over 2 years old.

All of the other countries would have to shed a significant percentage of the cow herd, mainly because they do not have many:

- surplus heifers, exceptions are France, Belgium and Luxembourg
- male animals over 2 years, except for the UK, France, Italy and to a lesser extent Germany
- suckler cows in excess of SCP quota, except for UK, France and Belgium.

Table 6 Animals removed to achieve the 1.8 limit

Country	Animals removed %				Remaining Cows
	Surplus Replacement Heifers	Males > 2	Surplus Suckler Cows	Other Cows	Per SBP quota
Greece	0	0	0	0	2.01
Portugal	0	0	0	0	3.72
Spain	0	0	0	0	4.11
Ireland	100	35	0	0	2.23
Italy	N/a	100	100	4	3.87
Austria	N/a	100	n/a	8	1.81
Finland	N/a	100	n/a	7	1.55
Sweden	N/a	100	100	11	2.12
UK	N/a	100	100	8	2.79
Germany	N/a	100	100	14	2.69
Netherlands	N/a	100	100	15	4.87
France	100	100	100	9	4.05
Denmark	N/a	100	100	19	2.36
Belgium	100	100	100	15	3.43
Luxembourg	100	100	100	12	3.47
EU15	N/a	100	100	8	2.91

Source: Author's estimates based on 1997 cattle census data

N/a = none available

Each of these countries would have to shed between 5 and 20 percent of their cow herd to maintain their chances of reaching the 1.8 target. This is unlikely to be a realistic option as dairy cows with probably much higher margins would have to be eliminated just to collect extensification. It is likely that a more viable alternative to retain access to extensification for the UK, France and Belgium is the option of using the replacement heifers for SCP. Even with the full exploitation of this option it would still be necessary to shed some dairy cows.

The data in the final column of Table 6 shows that in any event, Finland and Austria would not be able to retain sufficient cows to provide enough male animals to exploit their SBP quota. Therefore, aiming for the extensification premium becomes progressively irrelevant if a significant number of SBPs have to be sacrificed.

In summary, the inclusion of heifers in the stocking rate calculations would cause very little adjustment problems for Ireland if the stocking density limit is set at 1.8. But if Ireland were to avail of this limit, it would draw not only a very high proportion of the animals and nearly all the cattle farms into the extensification system. This would greatly increase the administrative stranglehold on cattle production in Ireland with severe consequences for the types of animals produced (see Dunne 2000 and working paper No. 5).

The 1.8 limit would still cause significant constraints for all other member states apart from Greece, Portugal and Spain. The UK, France and Belgium could exploit the option of using the replacement heifers for SCP to minimise, but not eliminate, the need to shed dairy cows to maintain access to extensification.

The Best Extensification Option

As noted earlier, the Agenda 2000 proposals of March 1998 retained the stocking density limit at 1.4 despite the requirement to include all animals in the calculations. But in the final agreement a year later Member States were offered the choice of extensification systems:

Option 1: a single payment of £79 with a stocking density limit of 1.4 LU

Option 2: two levels of payment depending on the stocking density

- £63 at < 1.4 LU
- £31.50 between 1.4 and 1.8 LU

The maximum revenue that Ireland could derive from extensification under options 1 and 2 are presented in Table 7 and Figure 1.

Table 7 Maximum revenue from extensification

Stocking density	Option 1	Option2	Difference (option 1 – option2)
Percent of SCPs and SBPs at < 1.4 LU/ha	IR£ million		
10	26	113	-87
20	51	123	-72
30	77	133	-56
40	103	144	-41
50	129	154	-25
60	154	164	-10
70	180	174	6
80	206	185	21
90	232	195	37
100	257	205	52

Source: Author's estimates

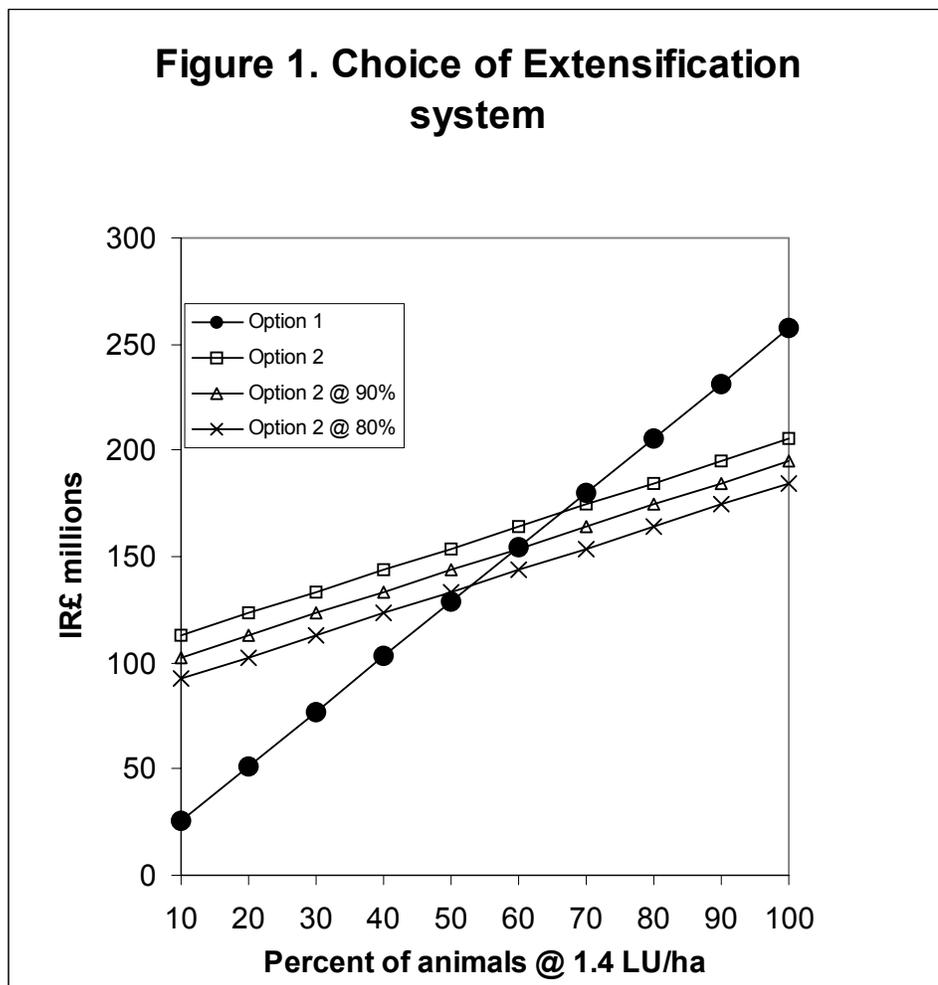
The following discussion does not take into account the impact of either extensification option on a range of consequential adjustments. These include:

- the transaction costs and disease risks associated with any increase in the volume of inter-farm trading of animals
- the revenue lost that could arise from the market based margin of the animals that might be eliminated
- the feed cost savings that could arise for the lower number of animals that might be retained as a result of the lower stocking densities
- the loss of revenue that could arise from any decline in the slaughter or export value of “unfinished” animals which might be sold prematurely to avoid stocking density penalties and thereby encountering a price discount
- the loss of revenue that could arise through price discounting of “older” (>30 months) animals in some age sensitive markets.

The revenue values shown in Table 7 assume the complete exploitation of extensification on the entire quota for both the SCP and the SBP animals. Under extensification options 1 or 2 respectively, Ireland could receive £257 million or £205 million if all the appropriate animals were stocked on farms at less than 1.4 LU. Table 7 shows that option 2 would give the highest revenue if less than 60 percent of the SCP and SBP animals were on farms with a stocking density below 1.4 when they collected their basic premiums. The lower the

percentage of eligible animals in this category the greater the benefit from extensification payments from using option 2.

Figure 1 demonstrates that Ireland would do better in terms of extensification payments under Option 2 if less than 66 percent of the animals are stocked on farms under 1.4, but all eligible animals would have to collect extensification. Option 1 is best if more than 66 percent of the animals were stocked on farms with a stocking density of less than 1.4 LUs when they claimed their SCP or the SBP. At the “break-even” point of 66 percent, Ireland could secure £170 million. However, as Figure 1 shows, the break-even point declines rapidly if a significant proportion of the animals under option 2 fail to collect even the £31.50 extensification premium which is payable for animals with a stocking density between 1.4 and 1.8. For example, the break-even point between the options declines to almost 50 percent in the event of 20 or more percent of the animals failing to collect the £31.50 extensification premium and the total revenue declines to £137 million.



Failure to collect extensification could arise through a combination of circumstances, which include:

- animals collecting SCP or SBP when located on farms with a stocking density in excess of 1.8, are not eligible to collect extensification

- animals not being entered for the basic SCP or SBP for various reasons (no area aid application submitted or on small farms with less than 15 LUs).
- animals stocked on farms with a stocking density greater than the 2 LU/ha limit for the basic SCP or SBP, these cannot even collect the SCP or SBP would therefore be excluded from extensification
- animals exported (mainly weanlings) before they have collected one or both SBPs, consequently extensification would not arise
- administrative errors relating to the applications for either the basic SCP or SBP or extensification itself

Therefore, in practice there could be some slippage in the ability to collect the maximum number of extensification premiums. The degree of slippage could also be related to the ease of compliance with the administrative criteria for the DPs and significance of the DPs, including extensification, in the margins and incomes of the farmers concerned. Working paper No. 5 showed that the DPs accounted for most of the margins and incomes of Irish cattle farmers. With shrinking market based margins the degree of slippage should be relatively low for the basic SCP and SBP. But given the administrative complexity of the extensification system itself some slippage is inevitable with the EPs.

In contrast to Ireland, cattle farmers in other EU countries were less dependent on DPs as they obtained higher prices for beef (working paper No. 4). The higher prices for beef resulted in a greater reliance by producers in these countries on the market based margins and less on the DPs for their income (Murphy *et al* 1999). But this position will be more difficult to maintain under Agenda 2000 as beef prices decline and the value of the DPs increase. The implications of the contrasting revenue structures for the competitiveness of Irish beef will be discussed later.

Selecting the best option

The analysis earlier in this paper demonstrated that Ireland would have little difficulty adjusting to the 1.8 limit. Considerable but not insurmountable adjustment would be required to achieve the 1.4 limit. Nevertheless, the adjustment problems for either option would be much greater for most other Member States than for Ireland. Two of the main factors in determining the best extensification option for Ireland are:

- the relative ability of the options to maximise revenue from EPs, and
- the implications of the chosen options for inter-country competitiveness for beef.

There was a sharp decline in cattle numbers, including cows, in Ireland in 1999. The probability is that there will be further reductions in stocking rates as cattle farmers adjust to all the aspects of Agenda 2000 and more farmers avail of REPS. In the future it is probable that over 60 percent of the SCP and SBP animals will be targeted at the high EP with a stocking density limit of 1.4, irrespective of the extensification options chosen at National level.

Given the inherent nature of suckler beef production in Ireland and its high concentration of suckler cows in the “western counties” the stocking limit of 1.4 will be attainable for a number of reasons. If the existing strong export trade in weanlings is maintained it will remove animals earlier from these farms and further assist in this endeavour. Another option would be the selling-on of weanling heifers once they begin to cause stocking density problems. It will also be easier to aim for the 1.4 limit due to the bringing forward,

by one month, of the SBP payments under Agenda 2000. For example, farms stocked at one suckler cow per hectare, could retain all their weanlings for almost 11 months and yet collect the SCP, plus the SBP at 9 months and extensification on both. They could also collect the same premiums on an even lower land base if the weanlings were sold earlier. From a stocking density perspective it would be best to sell the male weanlings once they reach 9 months, with the SBP collected, and the females before they reach 6 months. This would result in stocking density of 1.15 LU/ha for the cow and the male weanling and 1.0 LU/ha for the cow and the female weanling, (cow = 1LU, female calf = 0LU, male calf for 9 less 6 = 3/12 months x 0.6LU = 0.15LU). On average the stocking density would be 1.075LU/ha or expressed in another way the cow and its average progeny could be maintained on 0.768 hectares (1.075/1.4) and yet secure extensification for both the SCP and SBP at 9 months.

On the farms where stocking rates are critical, there is also the possibility of purchasing replacement heifers from specialised farms rather than rearing them or even using the 20 percent replacement heifer option for the SCP. If the export trade in weanlings continues to grow there may not be sufficient SBP animals available to “draw down” the full quota of SBPs, especially for the 2nd SBP. Again these animals are more likely to have moved out of the suckler cow territory thereby making it easier for suckler cows to remain within the 1.4 limit.

A further feature of the implementation of the Agenda 2000 was the doubling of the premium limit, from 90 to 180, per farm for the 9 and 21 month SBP. This latter facility is likely to be advantageous to the larger cattle fattening farms and should increase the demand for SBP eligible animals in the suckler cow regions, and consequently their market price. The added incentive to move out these animals will further enhance the likelihood that farmers with suckler cows will aim for the 1.4 limit.

When all these factors are taken into account it is likely extensification at the 1.4 limit will be collected on:

- almost all of the SCPs, and
- probably most of the 9 month SBP for male weanlings from the suckler herd, and
- at least a portion of the 21 month SBP on the progeny before they are two years old.

This portion of the 21 month SBP animals under the 1.4 limit could be substantial when account is taken of the combined effect of:

- the increase in the export trade in weanlings
- the reduction in the numbers of sheep, and
- the extra area available due to a reduction in the area devoted to cereals.

If the export trade in weanlings continues many SBP animals may have exited the country before they collect the 21 month SBP. This would have the effect of further increasing the percentage of the SBP animals below the 1.4 limit. Therefore, a very high proportion (over 66 percent) of the SCPs and the SBP animals derived from the suckler herd would have collected extensification at the 1.4 limit. It is probable that farmers with suckler herds would have benefited most if extensification option 1 had been selected.

A similar situation will probably prevail on dairy farms with relatively low stocking densities. These could trade heifers and young male animals strategically to ensure that

the stocking densities will be less than 1.4LU. The SBP animals that are most likely to have a problem with the 1.4 limit are likely to be those on the more heavily stocked dairy farms. A small but significant realignment of the calf and young cattle trading patterns on these farms could achieve the desired result.

The more intensive dairy farms, many often restricted from expansion by the lack of extra milk quota, could adjust their cattle enterprise and specialise in rearing calves and sell the male animals before the 1st SBP was collected. Such farms could then:

- avail of ‘cheap surplus milk’ to feed and rear the calves
- have the added benefit of a reduced calf mortality due to less trading of the animals in their most vulnerable period (see Fallon, 2000)
- indirectly avail of a significant portion of the DPs which would be capitalised into the calf-weanling price (see Dunne *et al*, 1998)
- operate their dairy enterprise outside the administrative constraints of the cattle payment system
- develop a replacement heifer enterprise which would supply dairy cow replacements to other dairy farms and possibly even “cross bred” cow replacements for suckler farms that are operating within the extensification system
- operate a specialised heifer or even a ‘non DP’ cattle fattening enterprise which would be driven by market based margins and targeted directly at consumer markets.

The specialised dairy type farms would then trade the ‘eligible’ animals onto the more extensive cattle farms before they collect the SBPs. Here, they would be better placed to avail of the higher level of extensification payment.

Under this scenario, the SBP weanling type animals from heavily stocked dairy herds, and possibly also from some suckler herds, would be traded onto extensive rearing farms at somewhat inflated values due to the capitalisation of DPs into eligible animal prices. The animals could remain on these extensive rearing farms until they have collected the 9 and 21 month SBPs and related extensification. But, before they are two years old, and rated as a full LU for stocking density calculations, they would be traded on to fattening farms or exported live to other countries.

On entering the fattening farms, the prices of these animals would be somewhat discounted due to the de-capitalisation of the values of SBPs and the related EPs which have already been collected on the rearing farms. Like the intensive dairy farms, these specialised cattle fattening farms would be operating outside the DP system and would be free to use stocking densities that are compatible with market based margins. They would therefore be very responsive to both factory and consumer prices in relation to degree of finish and quality of the beef produced. For these reasons it is highly desirable that some farms at least remain outside the administrative ambit of the extensification system.

The financial incentive for the individual farmer to either shed specific animals or rent in land will be evaluated in working paper No. 7. The implications of the choice of alternative extensification options on the revenue distribution among the different types of farms in Ireland will be evaluated in a further working paper in this series.

Maximising revenue

When all the above factors are considered, it is probable that in excess of 66 percent of the eligible animals in Ireland would be stocked at less than 1.4 LU per hectare when they collected their SBPs and SCPs. Therefore, as shown in Table 7 and Figure 1, Ireland would maximise the revenue from EPs by availing of the Option 1 extensification system.

The benefits from using Option 1 could be summarised as follows:

- yield the highest revenue for the country from extensification payments
- target a higher portion of the revenue towards the supply of cattle from the suckler herd which are of a higher quality relative to cattle from the dairy herd
- target more of the revenue towards the poorer regions of the country where extensive production systems are used
- release dairy farms and market oriented cattle fattening farmers from administrative bureaucracy associated with the DPs and extensification.

In any event to get the higher extensification premium even under Option 2, an increasing number of cattle farmers will aim for the 1.4 limit. The incentive to do this will increase as:

- calves become scarce and expensive
- the price of beef declines
- more farmers join REPS, with its associated compliance criteria
- more farmers secure off-farm employment which will lead to less labour intensive and operationally simpler production systems.

Competitiveness

As already noted, Ireland would have to make only relatively minor stocking rate adjustments to achieve the 1.8 stocking density limit for extensification using Option 2 under Agenda 2000. This effectively means that the proportion of animals receiving EPs would be similar to that which prevailed under the MacSharry system. The figures presented in Table 8 show that Ireland was particularly successful in securing EPs even as far back as 1994 when cattle prices and market based margins were reasonably good compared to the last few years of the decade.

Unfortunately, it has not been possible to locate more recent figures for the percentage of animals receiving EPs in the various countries. Despite being somewhat dated, these figures show that compared to the other countries, Ireland was at the top of the league in collecting extensification revenue, but France and the UK were also major users of the EPs.

Table 8 Animals collecting extensification in 1994

Country	Percent collecting extensification on:	
	Suckler Cows (SCP)	Special Beef Premium (SBP)
Greece	n/a	n/a
Portugal	72.7	19.4
Spain	n/a	n/a
Ireland	88.6	71.8
Italy	23.3	18.4
Austria	n/a	n/a
Finland	n/a	n/a
Sweden	n/a	n/a
UK	81.6	65.6
Germany	59.3	19.9
Netherlands	n/a	n/a
France	85.2	62.9
Denmark	n/a	n/a
Belgium	n/a	n/a
Luxembourg	82.0	84.3
EU15	n/a	n/a

Source: Dunne (1997)

n/a = no data available

As noted earlier, any incremental relaxation of the stocking density requirements would allow more animals in every country to secure extensification. But there is also a significant competitiveness dimension to such changes. If the incremental change relates to the top end of a declining curve or the last few percent of the animals then the proportionate gain is relatively small. The data in Table 8 indicates that this is the situation in Ireland for the 1.8 limit.

In contrast, if the incremental change relates to the bottom end of a rising curve then the proportionate gain could be substantial. As the figures in Table 8 indicate most Member States, apart from Ireland, already have limited access to EPs and are in this situation. It would appear therefore that extending the stocking density to 1.8 could be of greater advantage to other Member States as they have more limited access to extensification than

Ireland.

Even if Ireland were to maximise its revenue under extensification option 2, which appears unlikely, the country would appear to be trading part of its competitiveness just to secure this extra revenue by opting for the 1.8 limit. This situation is further accentuated when the differences in the dependence of Member States on market based margins for their incomes from cattle production is taken into account. Ireland, due to relatively low beef prices and better access to DPs (working papers No. 4 and 5) is less dependent on market based margins. Therefore, unless there is a further divergence in the beef prices between Member States, the economics of beef production in Ireland will be less sensitive to the decline in beef prices that will likely arise due to the reduction in EU price supports. Should beef prices decline, it will have greatest economic impact on intensive production systems, i.e. stocking densities in the region of 1.6 to 2.0. If this persisted it would discourage production and supplies from these intensive systems and this would result in a better overall market balance for beef in the EU. This would likely precipitate price convergence within the EU, which would be a major advantage to Ireland. In this scenario, Ireland would have both beef price convergence and very high access to DPs, especially extensification. Furthermore, future beef supply would effectively be controlled by the low market based margins throughout the EU and the quota system of SCPs and SBPs for individual Member States.

Apart from the issue of competitiveness, it does seem difficult to justify the use of the 1.8 limit. As the earlier calculations in Table 3 showed, the 1.8 limit could be justified as a measure to accommodate the inclusion of heifers which had been excluded in the stocking density calculations for the MacSharry limits of 1.4.

Even allowing for the different methods of computing the stocking densities for EPs and the basic SCPs and SBPs, animals stocked to the 1.8 limit could scarcely be considered extensive if all the animals that receive the basic SCP and SBP must first be stocked at less than 2.0 LU. The combination of the 2.0 limit for eligibility for the basic premium and the 1.8 limit for extensification, could imply that animals are considered to be stocked extensively even if the actual stocking density is as high as 90 percent of maximum limit of 2.0 ($1.8/2.0 \times 100$). For example, over half the animals in the EU could be expected to qualify for extensification unless the average stocking density in the EU was at least 1.8. Even if the average stocking density was 1.8, then half the animals would secure extensification but the other half must be concentrated in the extremely narrow stocking rate band of 1.8 to 2.0. This would appear improbable given the diversity of cattle production systems throughout the EU and the experience under the MacSharry system as outlined in Table 8.

The number of calves in the EU is severely constrained by the controls on cow numbers through the quotas for both milk and SCPs. The number of extensification premiums is controlled by the pre-requirement to secure either a SCP or SBP and the numbers of both of these are also controlled by quotas. When all these restrictions are combined with small and declining market based margins, the likelihood of any expansion in cattle numbers seems remote even where stocking densities are in the 1.8 to 2.0 range. This further undermines the logic of paying an extensification top-up on animals where they are stocked at a density of 1.8 which is as high as 90 percent of the maximum limit of 2.0 for the pre-requisite SCP and SBP payments. This issue becomes more incomprehensible in

the context of an overall EU budget limit for extensification under Agenda 2000 agreement.

Irrespective of whether extensification option 1 or 2 is being considered, the real problem for the future is the number of animals that are likely to be below the stocking limit of 1.4. It is difficult to establish the extent of the decline in the percentage of SCPs and SBPs collecting EPs at 1.4 when all animals are included in the stocking density calculations under Agenda 2000. The analysis outlined earlier in this report would suggest that Ireland would have to shed animals surplus to quota requirements for milk, SCP and SBP but nevertheless, the adjustments were modest compared to other countries. With the decline in the Irish cattle and sheep herds in 1999 most of this de-stocking has already taken place. Further adjustments would be feasible especially if they were accompanied by a re-alignment of cattle trading and production patterns as outlined above. If these adjustments were made, it is probable that up to 70 percent of the suckler cows and a somewhat smaller percentage of the SBPs would collect extensification under Option 1.

As outlined earlier in relation to the data in Table 5, the impact on all other member states would be much greater as they would have to remove two to four times more of their cow herd to reach the same target of 1.4. If the relevant adjustments were made, many Member States; namely Greece, Spain, Austria, Finland, Sweden and Denmark, would not have sufficient cows, two cows per SBP, to produce the required number of male animals to draw-down their quota of SBP. These countries would therefore be trading off SBPs against extensification if they were to try to maintain the MacSharry level of access to extensification under option 1. As already noted, cattle producers in most of the EU countries are more dependent than Ireland on the market based margins which in turn reflect higher cattle prices. This would also lessen the incentive to reduce stock numbers to achieve extensification.

In conclusion, Ireland may be the only country in the EU that would benefit from using Option 1. Undoubtedly, more Irish animals and farmers would collect extensification under Option 2 but:

- the overall revenue is likely to be lower (see Table 7, Figure 1, and related discussion)
- the revenue would be more poorly targeted in terms of income support
- the reward for product quality would be lower (output would contain more cattle from the dairy herd)
- the administration of the extensification for cattle would be more invasive in farming activities as it would involve more cattle and cattle farms, and other farm enterprises such as sheep and possibly even dairy farming, and
- the competitiveness of Irish beef production within the EU would decrease due to a reduction in the margins relative to competitors.

Unfortunately, as the Agenda 2000 negotiations progressed, Option 2 became a reality and this will allow Ireland's competitors further access to EPs. As already shown in Figure 1 and Table 7, countries with relatively low levels of access to extensification benefit most from Option 2. For these countries this extra access, even to the lower valued DPs, will be of increasing significance as the price of beef declines as envisaged under Agenda 2000. Should Ireland's competitors become even more successful in capturing EPs, there is also the added complication of the "administrative cap" on the EU budget available for extensification. If in the future, the budget is exceeded it is probable that the value of the

individual EPs will be scaled back *pro rata*. This would certainly not suit Ireland as it would effectively mean a scaling back of EPs in Ireland to finance EPs in other countries.

In the implementation of extensification for the year 2000, Ireland like the other member countries choose to use option 2. Apart altogether from the inter-country competitiveness aspects arising from the choice of the two options, this report suggests that option 1 may have been a better choice for Ireland. For the future this choice is still open. But before any change is made, the benefits in terms of the overall revenue from extensification and the distribution implications require a more detailed evaluation. It is planned to examine these aspects in future working papers in this series.

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APPENDIX

List of Abbreviations

Agenda 2000	Extensification system in the period 2002 to 2007
CAP	Common Agricultural Policy
DPs	Direct Payments
EP	Extensification Premium
LU	Livestock Unit
MacSharry system	Extensification system in the period 1992 to 1999
REPS	Rural Environment Protection Scheme
SBP	Special Beef Premium
SCP	Suckler Cow Premium

