

# FARM BUILDINGS



JOANNE FOX

## Cubicles perpendicular to the feeding barrier

TOM RYAN  
TEAGASC

THE drawing in figure 1 shows a plan of a new dairy wintering unit with the cubicles perpendicular to the feeding passage. This type of design has been around for a long time. The main difference with the one shown in figure 1 is the size of the cubicles. The cubicles here are longer giving the cows more room to lunge forward getting up and lying down. The cubicles facing the wall are 2.6m long and the ones head to head are 2.4m long. This has the effect of making the whole shed that bit wider, which is good because it gives the cows more space in the shed and increases the feeding face length.

The plan shows six rows of cubicles perpendicular to the

feed passage and a single slatted tank with 5.0m slats

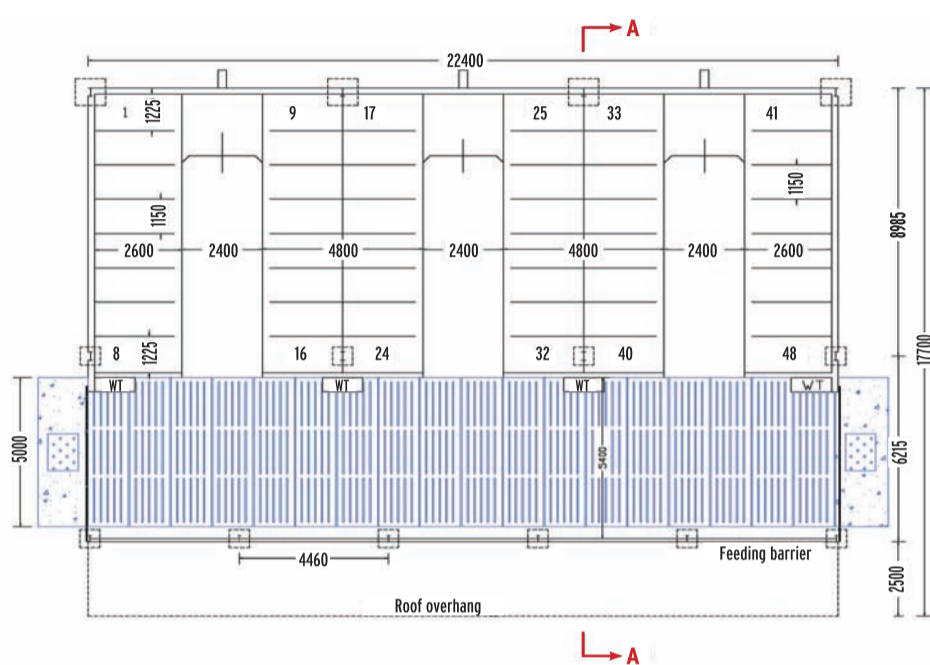


Figure 1

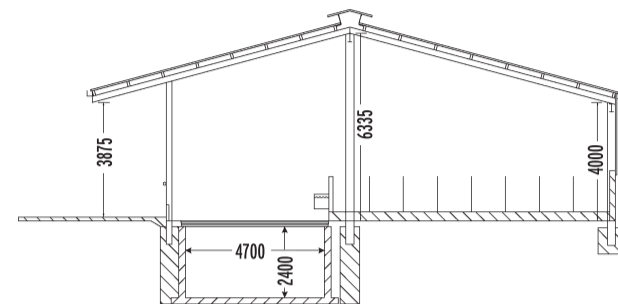


Figure 2

TABLE 1 DESIGN DETAILS

Number of cubicles	48
Rows of cubicles	6
Cubicles per row	8
Cubicle length (head to wall)	2.6m (8ft. 6 inches)
Cubicle length (head to wall)	2.4m (8ft.)
Cubicle widths (centre to centre)	1.15m and 1.225m at row ends
Cubicle passage	2.4m
Feed space per cow	0.466m (18 inches)
Net slurry storage	260m <sup>3</sup>
Tank capacity	284m <sup>3</sup>
Slurry storage	enough for 49 cows for 16 weeks
Tank internal dimensions	25.2m long x 4.7m wide x 2.4m deep
Slats	5.0m
Freeboard	0.2m
Space per cow within the shed	6.875m <sup>2</sup> (74ft <sup>2</sup> )
Space per cow at the feeding area	2.5m <sup>2</sup> (27ft <sup>2</sup> )
Eave height	3.875m - 4.0m
Number of water troughs	4
Crossover passages	none

Having to leave out cubicles at the crossover points is good from the point of view that it

means that there is more feed space per animal and more space in the shed, in general.

for the cows to feed on. The design details of the unit shown in figure 1 and 2 are outlined in table 1.

This is only one version of this type of design. There are many more. This type of design can have four rows of cubicles or eight rows of cubicles.

Versions with more than eight rows will work but cow segregation and movement may be a bit laborious and slurry storage/collection gets more complicated.

The number of cubicles per

row is not fixed at eight either. Where there are eight cubicles per row there is no need for a crossover point as shown in figure 1.

If you want to put the cubicles in to three bays with 12 cubicles per row; this can be done but you must leave two crossover points.

If we want to put water troughs at the crossover points we have to lose six cubicles at each crossover point in order to comply with the Department specifications.

## A design fitting to conversions

THIS type of design is also very suitable for conversions. If you have existing loose houses, cubicle sheds or a haybarn with lean-to's off it, with self-feeding or ring feeders; this type of design can be very suitable for conversion to an easi-feed system.

The issues here to take into account are; the condition of the existing buildings, the widths and the number of bays in the existing sheds as well as their location.

If these sheds are needed for other uses it may be better to go for the new buildings for the cubicle accommodation. No sense in having to build more sheds later, that are not grant-aidable. However, financial considerations will have a bearing on the final decision.

Excessive slopes along the length or across the gable ends can also make modifications difficult and should be discussed during the planning stage.

The reason the widths are important is that you would like to have space for the longer cubicle beds as shown in figure 1. This may not be too easy in the sheds that are already the standard 22 ft. wide.

Taking out walls between cubicles rows will provide good lunging space in head to head rows. If the lean-to's are 25ft. wide they fit very well in with this type of design. If there are cubicles already in the existing buildings then it all depends on the condition of the cubicles and how happy the cows are with them. You can always allow scope to upgrade the cubicles at a later date.

If the widths aren't ideal you can always work around it by bridging some of the stanchions to get the widths you need. You may have to add on another short lean-to or go fully or part of the way into another lean-to or haybarn. A 30ft. haybarn with two 22ft.

lean-tos works perfectly with no modifications to the stanchions. A 30 ft. haybarn with two 30ft lean-tos will work if one line of stanchions are bridged. What you can't have is a line of stanchions in the centre of a cubicle passage and it's not good to have stanchions right at the back of a cubicle bed.

The number of bays is also important to the design, because any more than three bays of cubicles (space for 12 per row) is going to increase crowding at the feeding area and reduce feed space, unless the feeding area can be lengthened in some way.

### FEEDING AREA

The feeding area may be lengthened to the left or right or an extra feeding alley may be installed along one side or other giving an L-shaped feeding area.

Sometimes you may also find there is a loose house without cubicles or a silage

pit between, for example, two four-bay cubicles houses. Putting the feeding area across the gable end of the three sheds will give enough feed space at the barrier.

### CONTROLLING OVERCROWDING

Overcrowding in the feeding area can be controlled by having enough room. The room can be got, obviously, by the length of the feed barrier but also by the width.

A good guide to the area needed where cows are lining up to feed is to have an area of at least 1.8-1.9m<sup>2</sup> (19-20ft.<sup>2</sup>) per cubicle place. Keeping feed in front of the animals at all times is worth keeping in mind.

**Note:** Just because this type of design may be a suitable option doesn't mean that a different type of layout may not be a better option. Look at all the options to have no regrets later!

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# FARM BUILDINGS



**TABLE 2 COSTING FOR THE 48 COW DAIRY UNIT SHOWN IN FIGURE 1 AND 2**

A Items being costed	B Measurement factor	C Cost per measurement factor (€)	D Area, linear metres each for this building	E Costs (€), column C multiplied by column D
Roof	per m <sup>2</sup>	80	396	31680
Side-cladding	per m <sup>2</sup>	35	116	4060
Tank	per m <sup>3</sup>	110	283	31130
Stanchion bases	each	145	10	1450
Cubicles and cubicle beds	each	195	48	9360
Concrete floors	per m <sup>2</sup>	25.5	87.6	2234
External walls	per linear metre	160	42.2	6752
Walls at ends of cubicles	per linear metre	100	14.8	1480
Feeding barriers	per each bay fitted	200	4.7	940
Feeding barrier walls	per linear metre	28	22.4	627
Pen dividing gates	per linear metre	73.5	10.8	794
Sliding doors	per m <sup>2</sup>	90	39.6	3564
Automatic scrapers	per passageway	2750	3	8250
Water troughs	each	250	4	1000
Electrical work	per m <sup>2</sup>	5.5	396	2178
Concrete apron in front of feed barrier	per m <sup>2</sup>	23.5	112	2632
Total costs eligible for grant aid	-	-	-	108131
Grant @ 60%	-	-	-	64878
Costs not eligible for grant aid	-	-	-	-
Cow mats	each	44	48	2112
Planning permission drawings	Estimate	1200	1200	1200
Planning permission fee	Fee	196	196	196
Grant scheme application	Fee	300	300	300
Total costs	-	-	-	11939
Total costs after grant	-	-	-	47061
Number of animals	-	48	48	-
Cost per animal before grant	-	-	-	2332
Cost per animal after grant	-	-	-	980
Roof and tank as a % of total	-	-	-	56%

Note: The costs above are excluding VAT.

## Slurry storage

IN **figure 1** slurry storage is provided with a single slatted tank with 5m slats (16ft. 6 inches). This gives enough storage for 49 cows for 16 weeks. Slurry storage for 18, 20 or 22 weeks can be provided by extending or deepening the tank, or both. The extended tank can be covered with slabs of slats, depending on the circumstances.

Slats should be used if it is extended, say, towards a parlour or if extra feeding face is required. However, rainfall storage must be allowed for if

the extension is not going to be roofed.

Other slatted tank options can also be considered e.g. double and t-shaped tanks, especially for the longer storage periods and where there are more than 8 cubicles per row. Outdoor tank options should also be considered, e.g. cast-in-situ concrete tanks, circular tanks, geomembrane and earth bank tanks. Suitable existing storage should be used where possible. It will simplify the design and reduce the cost.



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## Breakdown of costs for dairy unit

THE breakdown of the costs is shown in **Table 2**. If the grant only covers 50% of the actual total costs then the total costs after grant will increase by over €10,000 to over €57,000 or €1200 per cow.

Converting existing facilities will lead to substantial savings. For example, building a roofed tank at the gable end of existing cubicle houses will cost about €1,250 plus VAT before grant.

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