Threshold prices

The analysis of the profitability of a farm enterprise can also be done by comparing the price of the product with the unit costs of production.
The unit costs (average costs) are calculated by dividing the production costs by the production quantity.

Form. 5

If the costs are incurred not only by the production of one product but also by the production of several by- products, the value of the by-products must be considered in the determination of the production costs in order to achieve an adequate measure of comparison for the price of the main product. The same rule also applies if the direct payments (as non-marketable output) are included into the gross output. The reason for this correction can be easily explained:

From the above calculation it is clear that the (Net) Profit must be at least equal zero in order for the profitability limit to be reached.

The calculation of the Net profit looks (simplified) as follows:

Production quantity × **Price** 60 dt	× 11.42 €/dt	= 685.10 €/ha + Spin-off output	
(including direct payments) +		348.00 €/ha	
– Production costs (see Form 2)–			1,066.41 €/ha
= Net Profit=			-33.31 €/ha

The question, that should be answered now, is:

How high must be the price of the main product in order for the Net Profit to be equal zero?

The solution is found after transforming the following simple equation:

Productions quantity × Price + by-product output – Production costs = 0
Production quantity × Price + by-product output = Production costs
Production quantity × Price = Production costs – by-product output
Price = (Production costs – by-product output) / Production quantity

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The comparison for the calculated threshold prices is a result of comparing the prices of bread making and feedwheat according to their production. 11.42 €/dt
Analogically to the calculation of the (Net) Profit the step-by-step procedure allows here also a deep economic analysis:

Profitability threshold (long-term price lowest price limit)

From the calculation of all production costs (long-term total costs) for one production unit results in the *long-term* lowest price limit.
If the price of the product is equal to the long-term lowest price limit, then the net profit is zero (and all factors have an adequate rate of return) => profitability threshold!

In the calculation example the long-term lowest price limit for covering the total production costs (profitability threshold) is calculated as follows:

	Total production costs (see Form 2)	1,066.41 €/ha
–	Value of by-product output (including direct payments)	348.00 €/ha
=	Proportionate production costs of the main product	718.41 €/ha
/	Production quantity (main product)	60.00 dt/ha
=	Threshold prices of the main product	11.97 €/dt

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Production threshold (short-term lowest price limit)

If only the variable costs are considered in the calculation the result is called the short-term lowest price limit, which shows that the production can be continued reasonably from the economic point of view with available fixed capacities (=> production threshold!).

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The short-term lowest price limit can be calculated by gradual adding of variable costs:

	Variable costs (from GM calculation: supplies & services)		
–	Value of by-product output (including direct payments)		
+	Imputed costs for current assets	⇨ Production threshold I	2.63 €/dt
+	Imputed costs for labour (productive work)	⇨ Production threshold II	4.13 €/dt
+	Other opportunity costs (land, rights)	⇨ Production threshold III	8.05 €/dt

Profit threshold

If the opportunity costs for used factors are not taken into account in the calculation (as in the calculation of Profit), the resulting indicator is called threshold price at which the profit is equal to zero.

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In the calculation example the long-term lowest price limit to achieve the Profit (profit threshold): 7.22 €/dt

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Influence of the direct payments for land

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The calculation of the threshold prices shows not only pure costs calculation but also the influence of direct payments for land, which lowers the costs of production:

348 €/ha / 60 dt/ha = 5.80 € /dt

Without the direct payment for land the lowest price limits would be higher by this amount than the figure calculated considering the direct payment for land.

If there is free labour and land capacity (excluding opportunity costs) the wheat price is higher than the production threshold (I) even without considering the direct payment (I) and represents the most profitable alternative: ⇨ Production threshold I 8.43 €/dt

This applies also if there are opportunity costs for labour (without wages):

⇨ Production threshold II 9.93 €/dt

If there are still opportunity costs for land (or if rent payments should be paid), then production costs without considering the direct payments are higher than the achieved price:

⇨ Production threshold III 13.85 €/dt

Comparable appraisal of efficiency measures

The different efficiency measures of wheat production are closely interrelated and cannot be analyzed separately.
Each measure can be used to make a statement about whether the production (long-term or short-term) is economically reasonable.

It is impossible that one measure says that the production is profitable, while another measure indicates the inefficiency of the production!
The relations among the different efficiency measures can be illustrated in this way:

	Gross Margin / Net Profit	Factor Return	Threshold price
not profitable	< 0	< (opportunity) costs	< product price
profitability limit	= 0	= (opportunity) costs	= product price
profitable	> 0	> (opportunity) costs	> product price

In the example calculation these relations cannot be verified. Especially clearly this relation is shown in Form 5, because all efficiency measures are shown (simplified) parallel close to one another.

If the product price is set to be equal to the long-term lowest price limit (profitability threshold), then the resulting Net Profit (if other conditions remain unchanged) is equal zero (output=total costs) and the return of factors capital, labour and land will be exactly equal to the assumed imputes costs (weighted average).

Form. 5

If the costs of one of the factors capital, labour and land are set to be equal to the calculated factor return, then (if other conditions remain unchanged) the resulting Net Profit is equal zero (output=total costs), the return of other factors is equal to the assumed imputed costs (weighted average) and the lowest price limit is equal to the current product price.

These relations apply to both long-term (net profit & profitability threshold) and short-term indicators (gross margin I, II, III & production threshold I, II, III).