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THÜNEN

Beef and Sheep Network

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agri benchmark
Beef and Sheep Report 2018
– a summary of main findings

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1 Introduction

This report provides a short overview of the most important developments of the global beef and sheep sectors in 2017 / 2018. It looks at consumption, production, trade and prices globally. The economic analysis comprises price developments and benchmarking results from the *agri benchmark* data base. We also report about some topics that were discussed during the 2018 Beef and Sheep Conference in Galway / Ireland. **For more detailed information, for example detailed farm data and results, please contact *agri benchmark* Beef and Sheep Headquarters.**

2 The global picture

2.1 Consumption and production

In the last decade, global beef production and consumption has increased. Figure 1 (next page) shows the per capita (p.c.) beef consumption and its development in the countries participating in the *agri benchmark Beef and Sheep* Network.

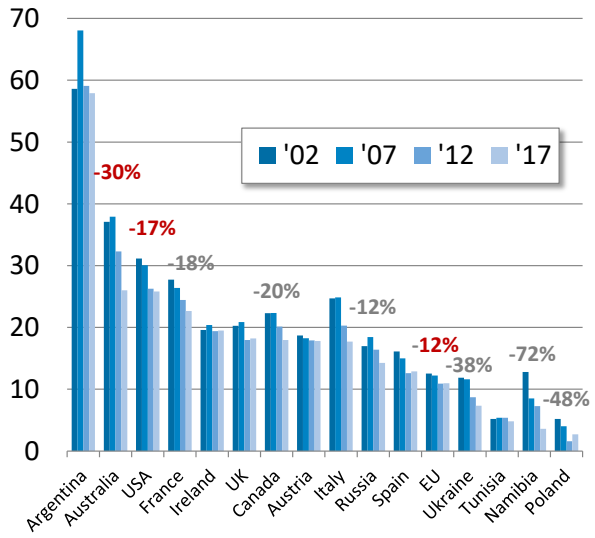
- Consumption patterns show significant differences between countries. The left chart shows countries with a decrease of consumption when comparing 2017 with 2002. In some cases like Argentina, beef consumption was higher in the period between these two points.
- Particularly strong decreases can be mainly observed in OECD countries, but also in Namibia, Ukraine and to some extent in Argentina.
- Countries with red bold percentage are somehow special: In Australia and the US, the decrease in domestic consumption means that more of the production has to be exported. In the EU, decreasing consumption goes basically along with decreasing production.
- The chart on the right hand side shows the countries with an increase in p.c. consumption. Uruguay, together with Argentina, has the highest p.c. consumption. Some emerging economies like Brazil, Paraguay, Peru, Chile and South Africa also show p.c. increases.
- The strong increase in p.c. consumption in Brazil, China and Indonesia comes along with large populations which means a significant increase in total consumption.

Global beef production has also been increasing. Figure 2 (next page) shows the Top 10 countries in terms of absolute and relative growth in beef production in the last 10 years.

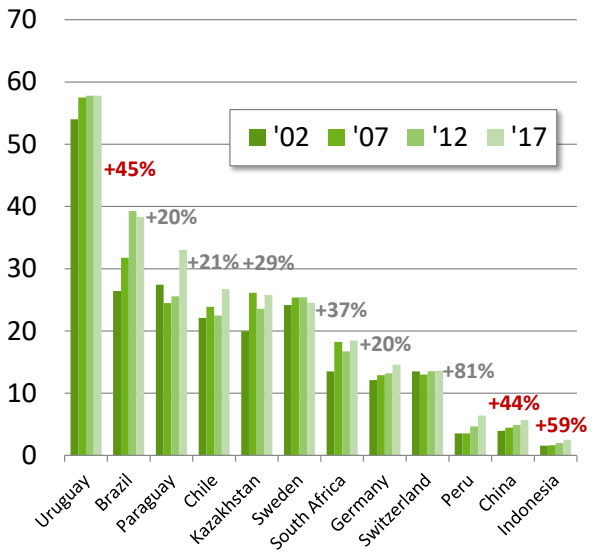
- China leads the list with an increase of more than 1.3 million tons, followed by Brazil with around 0.9 million tons. Most of the countries that follow are already well known beef producers. More surprising is to see Turkey, Uzbekistan and Myanmar belonging to this list, too.
- When looking at the relative changes, a different list of countries appears, many of them from Africa and Asia. They come from relatively low production levels and could increase production between two and four times. Also, Turkey and Myanmar belong to this group.

Figure 1 Per capita consumption of beef in selected countries 2002-2017 (kg per capita and year)

Decrease 2017 vs. 2002



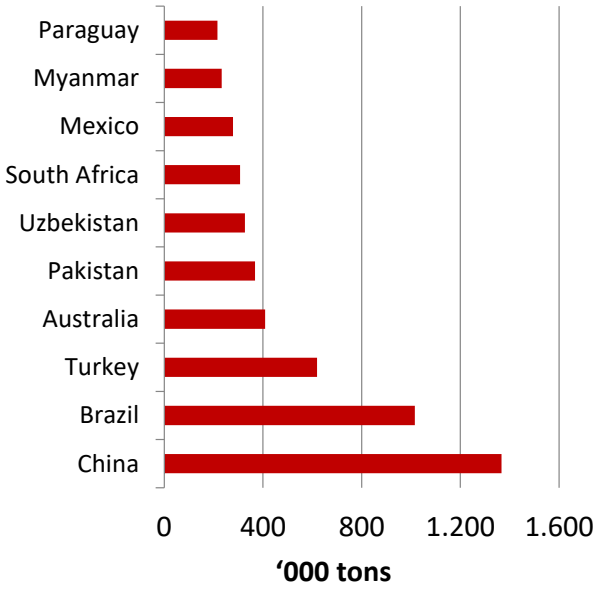
Increase 2017 vs. 2002



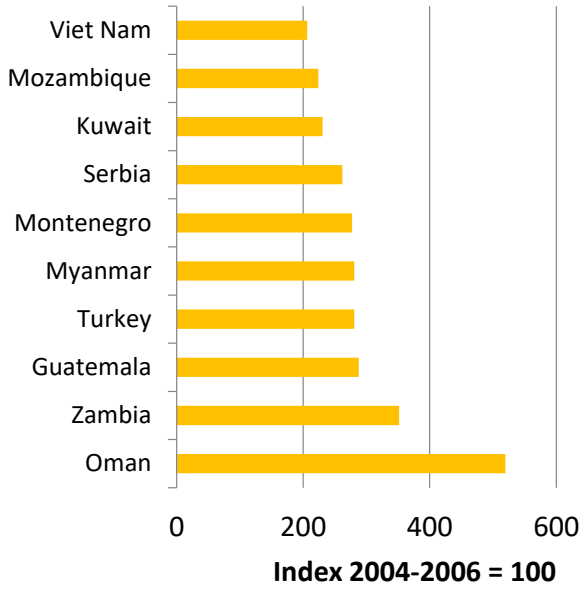
Source: *agri benchmark*, national statistics

Figure 2 Top 10 countries change in beef production 2004-2006 vs. 2014-2016

Absolute change ('000 tons)



Relative change (Index 2004-2006 = 100)



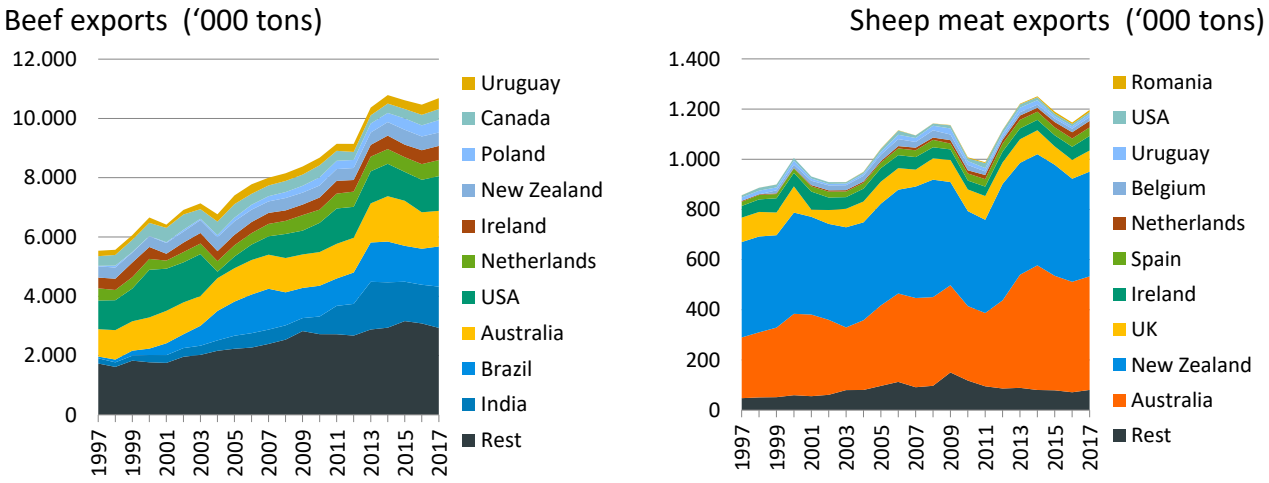
Source: Own calculations based on FAOStat 09.2018

2.2 Trade

Moving to trade of beef and sheep meat, Figure 3 shows the evolution of beef and sheep meat exports from 1997 to 2017. It should be noted that the EU is not displayed as Extra-EU trade to highlight the importance of the Intra-EU trade.

- Total beef exports have basically doubled in the period considered, while sheep meat exports only grew by approximately 50 percent.
- India, Brazil, Australia, the US and the Netherlands (re-export) are the biggest beef exporters. Exports are relatively diversified with a 'Rest' of almost one quarter of total exports.
- Sheep meat exports are much more concentrated than beef exports with Australia and New Zealand representing three quarters of total exports, mainly followed by EU countries. The 'Rest' is small and represents less than 10 percent of the total.

Figure 3 Top 10 beef and sheep meat exporters 1997-2017



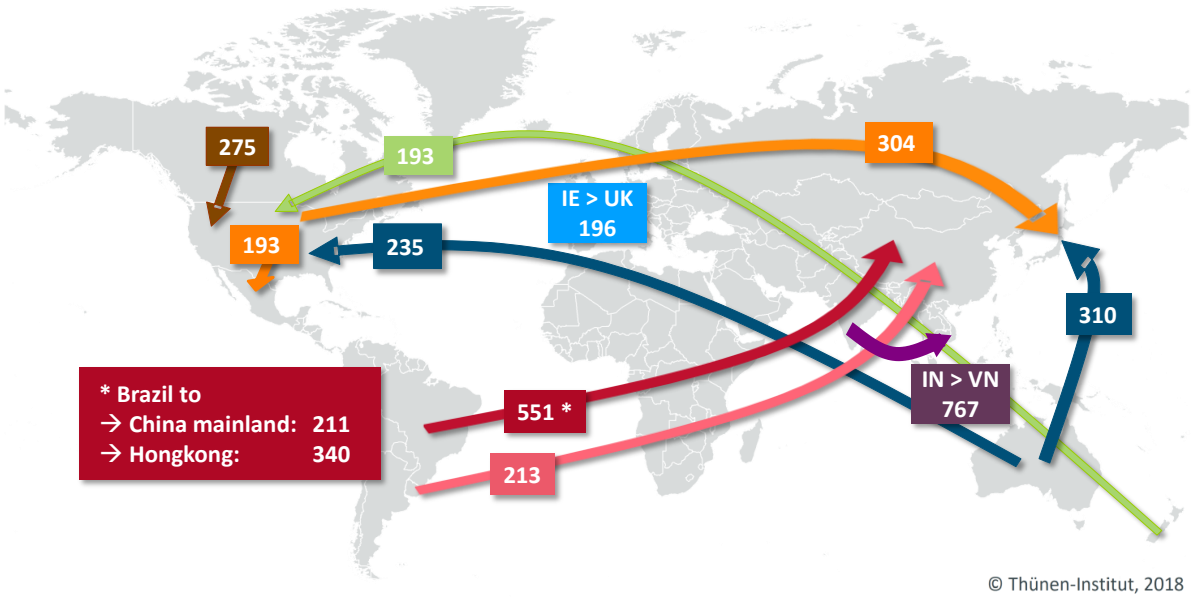
Source: Own calculations based on UNComtrade 09.2018

Figure 4 (next page) shows the Top 10 beef trade flows in the year 2017. Most of the Top 10 trade flows have not changed in the last 3 years but there is one new entry.

- Buffalo meat (carabeef) from India to Vietnam remains the most important export flow but it is known that a portion of that is re-exported to China.
- The traditional trade flow from Canada (Alberta) to the West of the US and from the US to Mexico continues, albeit the latter has less volume than in the past due to the expansion of the Mexican beef finishing industry.
- The exports from Australia and New Zealand to the US are mainly ground beef from grass-fed animals which is mixed with the grain-fed beef in the US to make hamburgers.
- Both the US and Australia compete on the high-value Japanese market with similar quantities of high-value beef.

- Ireland exports significant quantities of beef to the UK which is the single most important destination for Irish beef. It remains to be seen if and how this is going to change with the Brexit.
- China has already been a target for Brazilian beef for some years. Uruguay now also exports significant quantities to China, making it into the Top 10 trade flows.

Figure 4 Top 10 beef export flows 2017 – Uruguay is a new player ('000 tons)

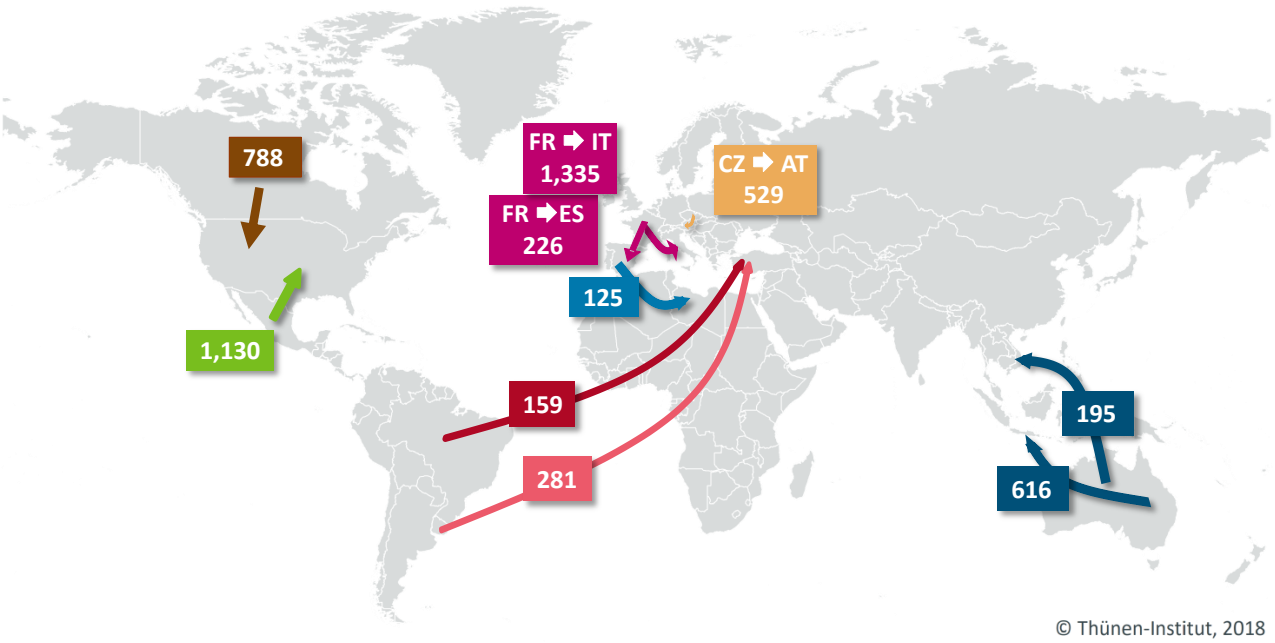


Source: UNComtrade 09.2018

From 1996 to 2016, live cattle exports for breeding – and increasingly for further feeding and slaughter – almost doubled. Live sheep exports showed some ups and downs and are basically back to 1996 levels. Figures 5 and 6 (next page) show the Top 10 export flows of live cattle and live sheep in 2016, respectively.

- Traditional North American trade flows are the weaner / backgrounder trade from Mexico to the US and from Canada to the US.
- The trade of weaners form France to Italy (a deficit market of beef) and to Spain (finishing of yearlings in a straw – concentrate system) is another traditional trade, like the trade of weaners from the grassland regions of Czechia to Austria. The same applies to the feeder cattle export from Northern Australia to Indonesia for finishing in the feedlots surrounding Jakarta.
- The trade flows from Brazil and Uruguay to Turkey are relatively new and reflect the government and private investments injected to the Turkish beef sector. At the same time, the Spanish live cattle exports to Libya are a result of continuously declining domestic consumption with basically constant production.
- Finally, the trade of live cattle from Australia to Vietnam is relatively new. The same applies to live cattle from Australia to China but with lower numbers (not belonging to the Top 10).

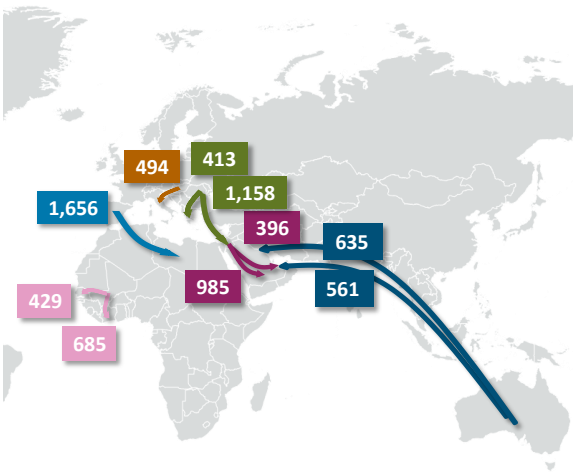
Figure 5 Top 10 live cattle export flows 2016 ('000 head)



Source: UNComtrade 09.2018

Figure 6 Top 10 live sheep export flows 2016 ('000 head)

- Traditionally, the most important trade flows end up in the Middle East and in Africa.
- Australia's exports go to Kuwait and Qatar.
- Similar to the live cattle exports, the large Spanish live sheep exports to Libya are a result of demand and the declining domestic market.
- Romania exports not only to Greece but also to Jordan. It seems that from there sheep are re-exported to Saudi Arabia and Qatar.
- Finally, Mali sheep go to neighbouring countries Senegal and Ivory Coast.

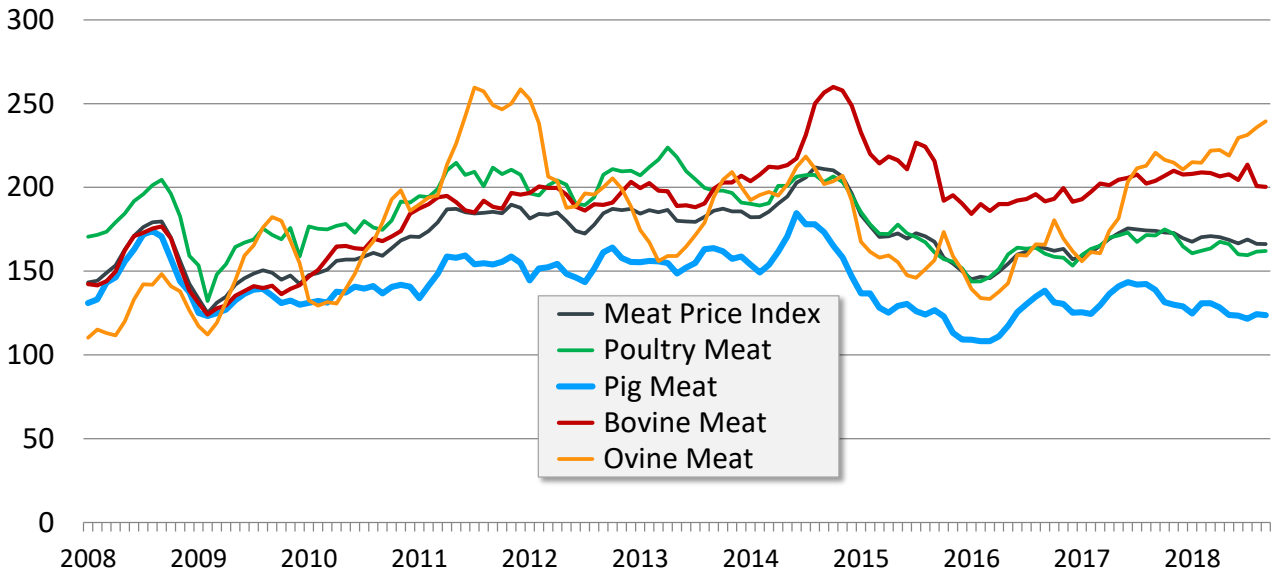


Source: UNComtrade 09.2018

2.3 Prices

The FAO meat price index until September 2018 is shown in Figure 7. Prices show a sideways or downward movement except the sheep meat price which points clearly upwards, approaching the all-time-high levels of 2011/12.

Figure 7 Meat prices move sideways to downwards, only sheep meat points upwards (FAO meat price index 2008 – 09.2018)



Source: FAO Meat Price Index (2018)

Figures 8 and 9 details the beef and sheep price developments in the *agri benchmark* countries for the last 3 years in national currency and in USD-terms. Some highlights are:

- The majority of domestic beef prices remained stable or increased in the last 3 years.
- Exceptions are the prices in **Canada** and **USA** which declined sharply in 2016 after the historic highs of beef and cattle prices in 2014 and 2015, respectively, due to production rise in both countries and the decrease of the Canadian feeder cattle exports to the US. In 2017 the Canadian beef exports were up 6 percent due to strong international demand that pulled products away from the domestic market and thus a slight recovery for beef prices in Canada. The 2017 beef prices in the US have remained relatively stable thanks to several factors such as a steep decline in carcass weights, excellent domestic demand and growing exports.
- Price developments in USD-terms looked different, particularly in 2015, due to the significant devaluation of national currencies against the USD which in most cases over-compensated the domestic price changes.
- The abolishment of the EU dairy quota in **Europe** in 2015 and the subsequent increase in dairy cows slaughter negatively impacted beef prices in 2016. Prices slightly recovered in 2017 due to the decrease in dairy cow inventory and thus the lower slaughter from dairy in-

duced by limited calves supply in beef sector. In **France** and **Spain**, beef prices were also supported by the growing livestock export market in 2017.

Figure 8 Percentage changes of beef price developments in *agri benchmark* countries (3 years, national currency and USD)

Country		Local currency			USD		
		14-15	15-16	16-17	14-15	15-16	16-17
Argentina	AR	23	43	9	8	-11	-3
Austria	AT	4	-3	3	-13	-3	5
Australia	AU	46	20	-4	22	19	-1
Brazil	BR	17	5	-2	-16	0	7
Botswana	BW	-2	0	2	-15	-6	7
Canada	CA	19	-18	2	3	-21	4
Switzerland	CH	7	1	1	2	-2	1
China	CN	0	0	0	-2	-7	-2
Colombia	CO	5	26	3	-24	13	7
Czechia	CZ	0	-1	3	-16	0	8
Germany	DE	5	-4	4	-12	-4	6
Spain	ES	-2	1	4	-18	1	6
France	FR	-1	-3	5	-17	-3	7
Indonesia	ID	8	6	3	-5	8	2
Ireland	IE	7	-5	0	-10	-6	2
Italy	IT	1	-12	-8	-16	-12	-6
Kazakhstan	KZ	-1	3	15	-18	-35	20
Morocco	MA	-18	1	1	-31	1	2
Mexico	MX	11	23	5	-7	5	4
Namibia	NA	-2	8	21	-16	-6	33
New Zealand	NZ	18	2	4	0	2	6
Peru	PE	1	4	1	-12	-1	4
Poland	PL	8	4	1	-10	-1	6
Paraguay	PY	2	5	10	-15	-2	11
Russia	RU	27	1	2	-19	-8	17
Sweden	SE	17	12	-1	-5	10	-1
Tunisia	TN	0	7	6	-14	-2	-5
Ukraine	UA	50	-3	26	-19	-17	21
UK	UK	-1	-3	7	-8	-14	2
USA	US	0	-19	-1	0	-19	-1
Uruguay	UY	10	6	0	-10	-2	5
South Africa	ZA	8	11	20	-8	-4	33

Meaning of colours				
	less than -10 %		1 % to 10 %
	-10 % to - 1 %		more than 10 %
	- 1 % to +1 %		

Source: *agri benchmark*, national statistics

- The macro-economic conditions and the subsequent currency devaluation have been the main factor influencing beef prices, mainly in **Argentina, Kazakhstan, Tunisia and Ukraine**. In Argentina, the recent severe drought wave and the increased female slaughter are expected to negatively impact the number of calves and higher cattle losses for the near future.
- The drought during the mating season in 2015-2016 in **Brazil** pushed up calf prices by 40 percent in 2016. The Brazilian herd had recovered in 2017 and calf prices were 11 percent below the 2016 levels. Brazilian Real appreciated by 8 percent against the USD in 2017, resulting in higher USD beef prices.
- The high beef price levels in **Namibia** and **South Africa** were triggered by increased exports. South Africa became a net exporter of beef for the first time in 2016 by a small margin, mainly to the Asian market. In Namibia, the continuous increase of weaner exports to South Africa (plus 47 percent year-on-year) has played a major role in keeping cattle prices at high levels.

Figure 9 Percentage changes of sheep price developments in *agri benchmark* countries (3 years, national currency and USD)

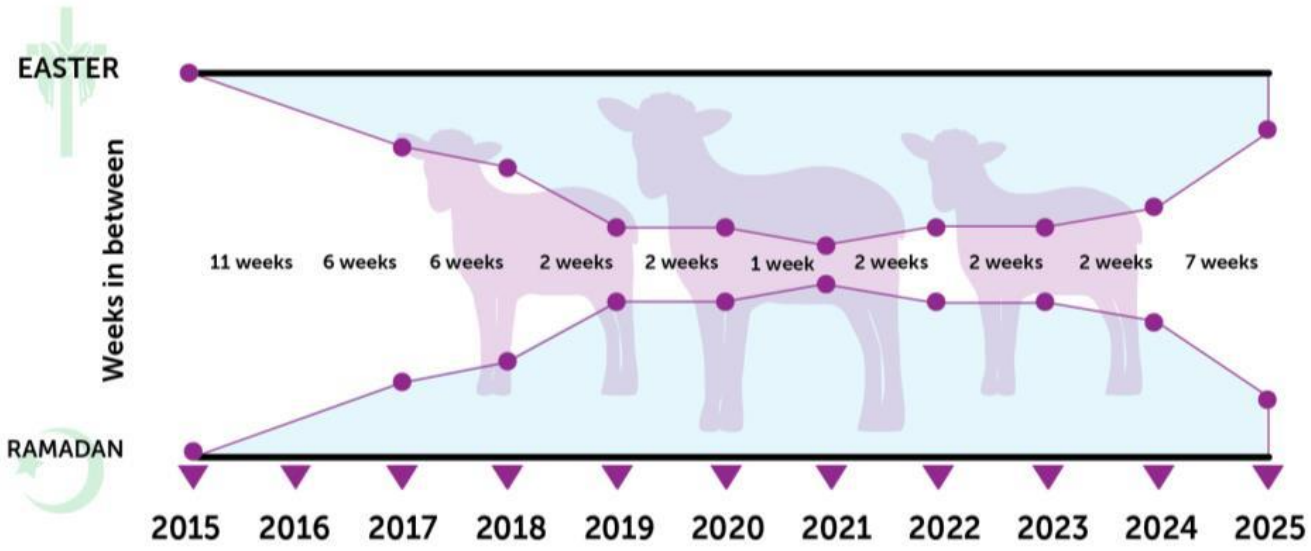
		Local currency			USD		
Country		**14-15**	**15-16**	**16-17**	**14-15**	**15-16**	**16-17**
Australia	**AU**	7	3	11	-11	2	14
Brazil	**BR**	15	6	3	-18	1	12
Canada	**CA**	23	-3	9	6	-6	11
China	**CN**	-6	-9	0	-8	-14	-2
Colombia	**CO**	3	11	0	-25	0	3
Germany	**DE**	6	1	0	-12	1	2
Algeria	**DZ**	2	0	-6	-18	-8	-7
Spain	**ES**	7	-5	5	-10	-5	7
France	**FR**	0	-2	0	-17	-2	2
Ireland	**IE**	2	1	-3	-15	1	-1
Iran	**IR**	2	1	-3	-15	1	-1
Morocco	**MA**	2	-7	7	-13	-7	8
Mexico	**MX**	-1	11	4	-17	-6	2
Namibia	**NA**	6	9	18	-9	-6	30
New Zealand	**NZ**	-6	-3	20	-20	-3	23
Tunisia	**TN**	0	5	-4	-14	-4	-15
Ukraine	**UA**	36	26	10	-27	7	6
UK	**UK**	-9	8	3	-16	-4	-3
Uruguay	**UY**	-2	-14	1	19	-7	-4
South Africa	**ZA**	9	8	23	-7	-6	36

Meaning of colours		
	less than -10 %	1 % to 10 %
	-10 % to - 1 %	more than 10 %
	- 1 % to +1 %	

Source: *agri benchmark*, national statistics

- The recent 4-year drought (2013-2016) in **Australia** had one of the largest impacts on the national cattle herd and sheep flock size which fell by 11 percent. The drought breaking in 2016 encouraged herds and flocks' rebuilding and caused record prices for cattle and sheep. However, weather conditions with below average rainfall and hotter-than-normal temperatures in 2017 hampered the producers' efforts to rebuild the cattle herds – thus more beef supply hit the market. This situation has negatively impacted beef prices in 2017. Despite the same weather conditions sheep prices in Australia have generally held firm throughout most of 2017 supported by strong international demand (particularly from China).
- Unprecedented weather fluctuation in **Algeria** in 2017 and the subsequent poor pasture conditions, lower grain harvest and expansion in supplementary feeding led to destocking of sheep flock. This means higher meat supply which in turn causes lower sheep meat prices.
- Among other factors like overall demand development and growing population of Muslim societies, global sheep prices also have a seasonal pattern which is often driven by religious holidays, among them Easter in the Christian countries and Ramadan and Eid al-Adha in the Muslim countries. Figure 10 shows that in the time interval between Easter and Ramadan is narrowing to only 2 weeks in the next 6 years. As a result we might see even higher seasonal price spikes but probably lower prices in other times of the year. Limits on the ability of the major suppliers to concentrate supply on just one time of year (especially the hot Middle East summer months and particularly for live sheep) might cause considerably more within-year price volatility.

Figure 10 The time interval between Easter and Ramadan



Source: Fennell D (2018) Growing Irish Sheep Meat Exports. Presentation at the Global Forum of the Beef and Sheep Conference 2018, 19. June 2018, Galway

3 International comparison

The source of all following charts is the *agri benchmark* Beef and Sheep Result Data Base of the year 2018 with the farm economic data from the year 2017. The charts are only a minimal selection of the wealth of the data base. The full data base including time series and sensitivity analysis is available to partners and clients.

3.1 Beef production

The following section differentiates into the cow-calf enterprise and the beef finishing enterprise. In both cases as well as the sheep, we look at the most important performance indicators and the bottom line economic indicators – costs, returns and profitability.

Explanatory notes on the presentation of the results in the following charts

1. The farms represent typical regional farms and are surveyed using the standard method developed by *agri benchmark* to define typical farms. Details are available on the *agri benchmark* website: http://www.agribenchmark.org/agri-benchmark/value-and-approach.html
2. Most of the charts show a ranking by the selected indicator instead of a cross country comparison. The rankings are sub-grouped according to production system indicators. In the cow-calf enterprise, the subgroups are '*outdoor*' (where animals stay outside all year round) and '*winter barn*' systems (where animals are kept in barns mainly during winter times). In the beef finishing enterprise, the groups are '*cut and carry*', '*grain-fed*', '*pasture*' and '*silage*'. These definitions are based on the dry matter composition of the feed rations.
3. Explanation of the names of the farms on the x-axes:
   Country_Average number of suckler-cows _Number of finishing cattle sold per year. Examples:
   AR_800_630 Argentinian farm with 800 suckler-cows and 630 finished cattle sold per year
   AT_25_0 Austrian farm with 25 suckler-cows and no finishing cattle
   DE_0_280 German farm with no cows and 280 finishing cattle sold per year

Cow-calf results

Figure 11 (next page) shows the ranking of the number of weaned calves per 100 cows and year (weaning percentage), mirrored with the total weight produced per cow and year, for outdoor and the winter barn systems.

- Weaning percentages vary from 50 to almost 100 percent with more variation on the outdoor systems than in the winter bran systems.
- Outdoor systems tend to display lower weaning percentages ranging from around 50 percent to 80 percent (and some beyond) whereas winter barn systems start with 80 percent and can go up to 100 percent.
- There are various reasons for the differences observed, some of which determine each other. Climatic and soil conditions usually determine whether it is possible to keep animals outdoor all year. Together with various types and levels of disease pressures they also impact the choice of breeds. The ability to grow forage and crops for cattle feeding impacts the nutri-

tional level of the animals. Finally, price relations, particularly land and labour prices impact on the management intensity. All these factors impact the calving percentage.

- In general, animals in adverse climatic conditions and with low feeding levels – thus many animals in rangeland type of systems with very low stocking rates – tend to have lower weaning percentages than animals in moderate climatic conditions which are fed supplementary energy or protein feed, often in winter barn systems.
- When confronting the weaning percentages with the total weight produced per cow and year, no clear correlation can be found.
- There are two main reasons for this: a) high weaning percentages do not necessary go along with high weaning weights and b) the total weight also includes weight of cull cows, breeding cattle and old cows sold for further finishing. The result does not change if the 220 days standard weight for the weaners is applied.
- The same conclusions can be drawn when replacing total weights by total returns in this chart.

Figure 11 Number of weaned calves per 100 cows and year and total weight produced per cow and year 2017

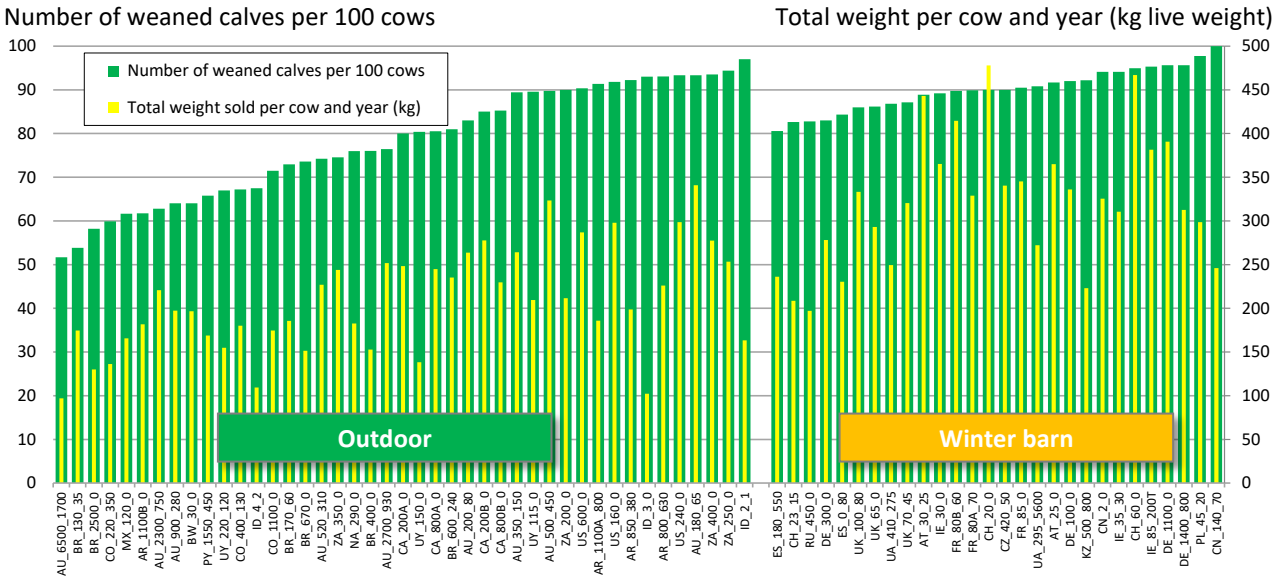
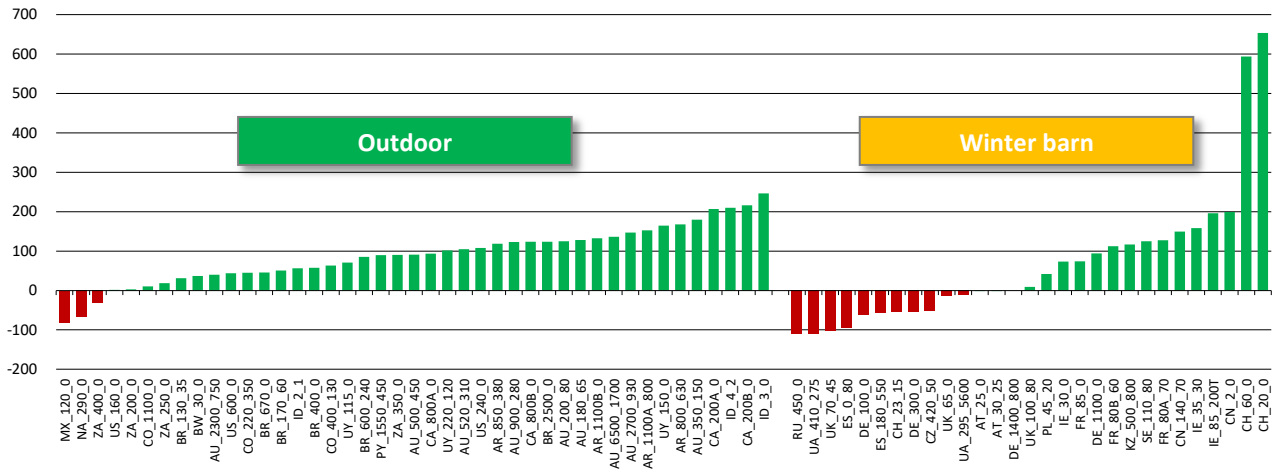


Figure 12 shows the medium-term profitability per 100 kg live weight produced of the cow-calf enterprises in the year 2017. 2017 was a relatively good year with the majority of the enterprises showing positive results. It looks like the outdoor systems perform better than the winter barn systems. On one hand, this makes sense because the winter barn systems tend to have higher depreciation and labour costs due to the infrastructure and machinery required for barns as well as feed and forage production and distribution. It should, however, be mentioned that one of the reasons why outdoor systems look slightly better is that the high number of farms from Australia (9) and Brazil (6) have a relatively weight in this result.

Figure 12 Medium-term profitability of the cow-calf enterprise 2017 (USD per 100 kg live weight)



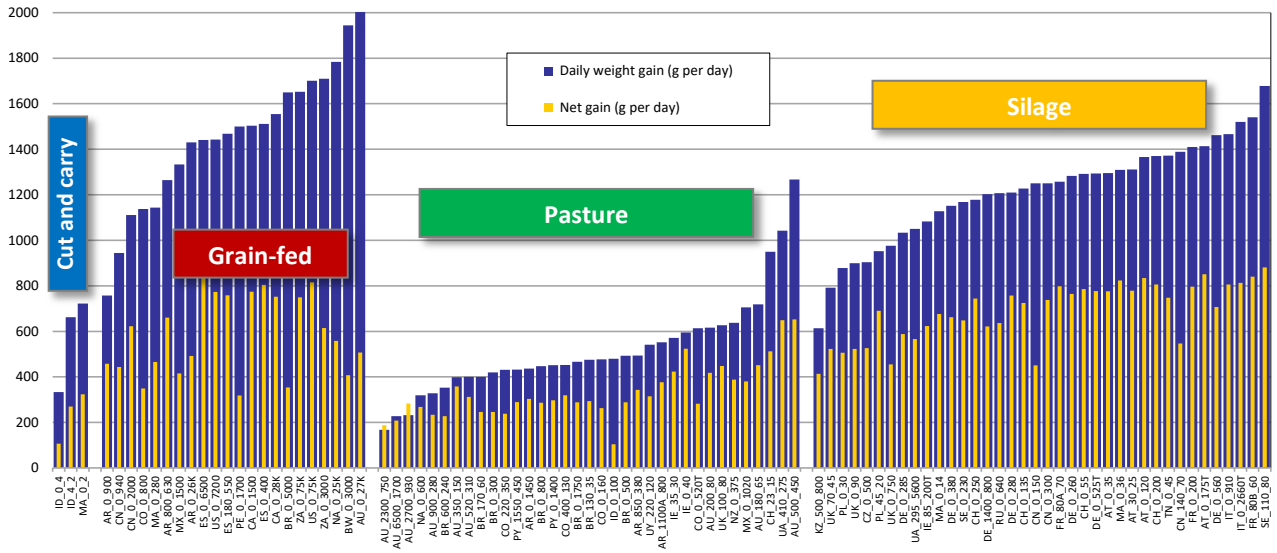
Beef finishing results

Daily weight gain and net gains in the beef finishing enterprise are shown in Figure 13.

- Unsurprisingly, grain-fed systems display the highest daily weight gains, followed by silage systems, pasture and cut and carry systems. The main reasons for the differences are a) energy content of the feed and b) the duration of finishing.
- Some of the extremely high values in the grain-fed systems can be explained by two reasons, resulting from the fact that some animals had a long pasture-based life before being transferred to the feedlot for finishing: a) compensatory gain in those cases where these animals come from rather marginal pasture conditions; b) belly fill. Animals that enter the feedlot with relatively empty stomachs also gain weight because their bellies are filled over time and until the time of slaughter. A 30 kg difference in 100 days of finishing creates a daily weight gain of 300 g per day.
- The above is one of the reasons why we introduced net gain as an additional performance indicator. Net gain reflects the entire life of the animals and not just the finishing period. It means that also the pre-feedlot life described above is reflected in the equation, resulting in much lower weight gains in the grain-fed systems, particularly when compared with silage systems.
- Silage systems are characterised by relatively high nutritional levels throughout the entire life of the animals. This applies to cattle from dairy origin which usually enter the feeding and finishing phase at relatively low age and for a relatively long period. It also applies for weaners from cow-calf origins where calves show relatively high weight gains before weaning based on the milk consumption from their mothers.
- Pasture and cut and carry systems show the lowest gains but also significant variation depending on the management and grazing system and associated feed supply.

Figure 13 Daily weight gain and net gain (g per day) 2017

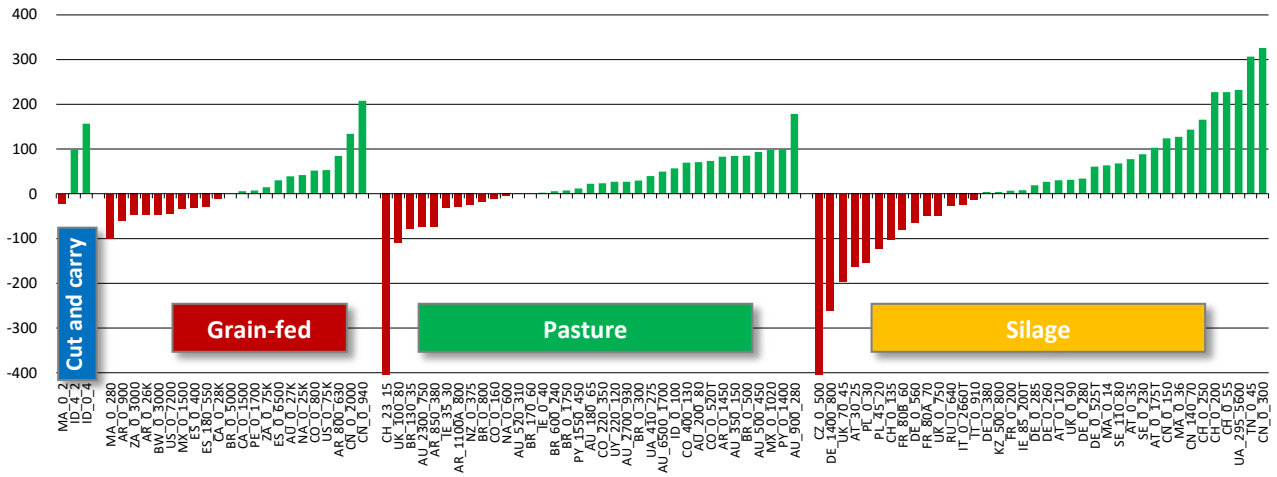
Net gain = carcass weight / age at slaughter



Compared with the cow-calf results, a higher proportion of beef enterprises was unprofitable. The proportion of unprofitable enterprises is similar throughout the production systems. This does not mean that the entire farm is unprofitable. In fact, there are only 14 out of 97 farms unprofitable on whole-farm level. A number of reasons are responsible for this result. The EU-farms receive decoupled payments (in contrast to cow-calf where a higher proportion of these payments are coupled and thus accounted for in the cow-calf enterprise). These do not show in the beef finishing enterprise but become effective on whole-farm level. Further, a number of farms have multiple enterprises where for example crops compensate for losses in the beef finishing enterprises.

Figure 14 Mid-term profitability of the beef finishing enterprise 2017

(USD per 100 kg carcass weight)



3.2 Sheep production

The explanatory notes for beef (Chapter 3.1) also apply to the sheep farms. The numbers in the sheep farm names indicate the number of ewes. Figure 15 shows the number of weaned lambs per 100 ewes (weaning percentage) and the total weight produced per ewe.

- There is huge variation due to the fact that depending on the natural conditions, the breed and the nutritional levels, there are different numbers of lambings per year, different proportions of twins and triplets and different mortalities.
- The range is from just above 60 in a South African farm (with an important impact of predators on mortality) via levels of 100 – 120 in some European and Australian farms to levels of above 120 – 160 (again in EU and Australian but also in the Mexican farm which is a confined system with silage feeding and overall high productivity, typical for the North of the country).
- When looking at the total weight per ewe and year, there seems to be a higher correlation with weaning percentage than in cow-calf. The reason is probably that weaning weights of lambs have a relatively high proportion in total weight produced and lamb weaning weights are closer to each other than in the cow-calf. Exceptions are the two Australian farms with exceptionally high weights per ewe which are due to the high lamb weights. This reflects an industry trend to keep lambs longer.

Figure 15 Number of weaned lambs per 100 ewes and year and total weight produced per ewe and year 2017

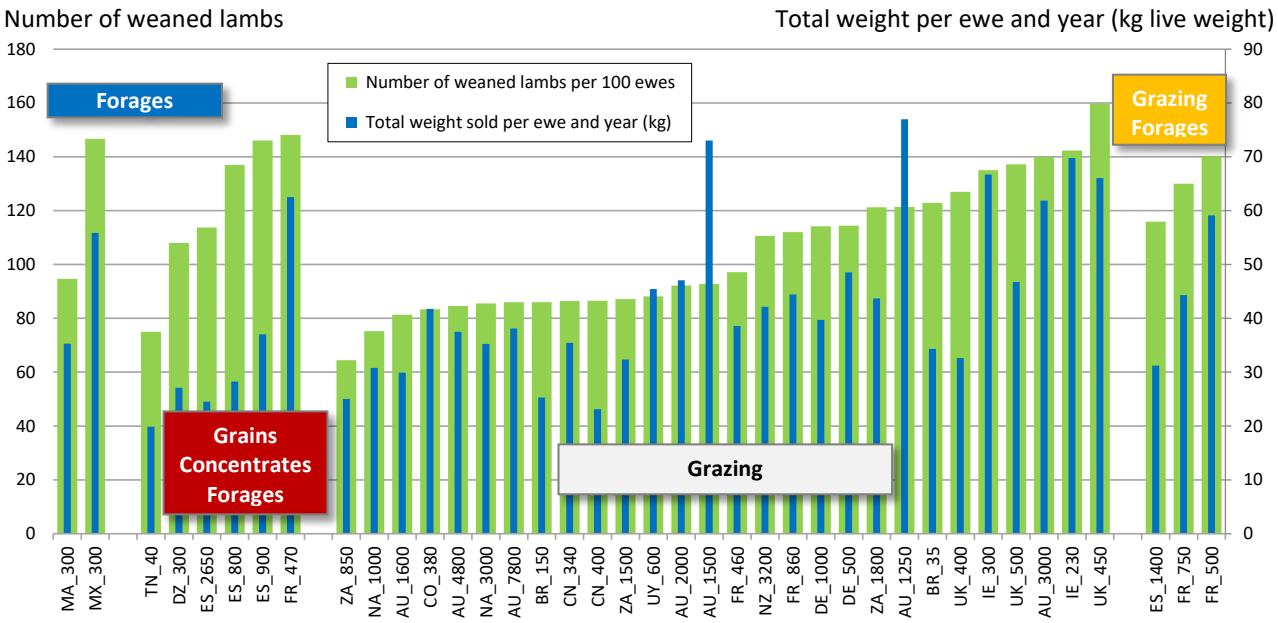
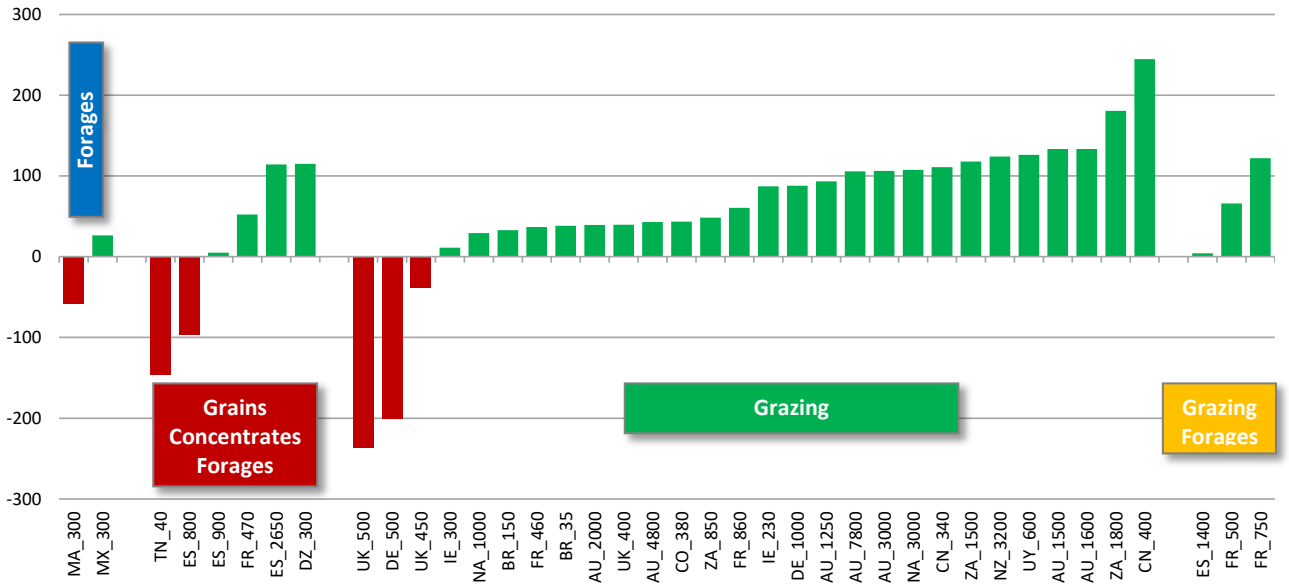


Figure 16 shows that most of the sheep enterprises were profitable in 2017. There is basically no difference on whole-farm level. Main reasons for losses in the EU-farms are low productivity, high labour costs, depreciation and in the case of the North African farms extremely high feed costs. This is the aftermath of the drought situation from 2016.

Figure 16 Mid-term profitability of the ewe enterprise 2017 (USD per 100 kg live weight)



4 Other topics

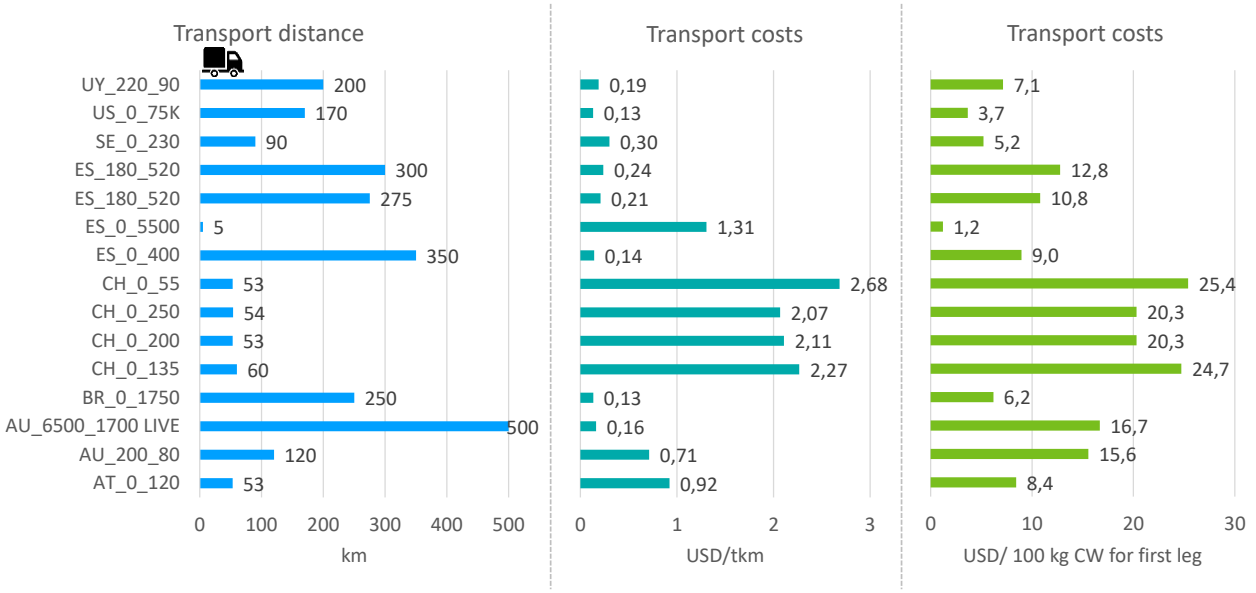
4.1 Transport costs in beef production

Transport costs are part of the beef value chain. Extending the farm level exercise, transport costs were analysed in selected countries. The focus was on the first delivery site after the farm which except for one case was the abattoir. Information was provided by *agri benchmark* partners via an online questionnaire. Figure 17 shows the result for selected countries (Austria, Australia, Brazil, Switzerland, Spain, Sweden, USA and Uruguay) and farms.

- Transport distances vary significantly and are lowest for the large Spanish feedlot and the farms in the Alpine states. They are highest for the live cattle export from the Australian Northern Territory to the port.
- Due to the different size of transport vessels, road conditions (duration of transport) and regulatory framework, transport cost per ton-kilometer (taking the transported weight into account) are not necessarily linked to transport distances. As a result, the picture changes in a way that the cost in Switzerland increase significantly whereas most other costs – especially in Europe and in the Australian live export farm – are relatively lower.
- On a carcass weight basis these relations remain basically similar. The Swiss farms remain those with the highest transport costs, followed by the Australians.
- Figure 18 shows a) the total of the cost on farm level plus b) the transport costs to the first delivery site. Transport costs are only between 0.3 and 3 percent of this total (see red circles for the extremes). Further calculations show that transport costs to the final delivery site (like overseas destinations) can reach much higher levels, up to 15 percent of this total.

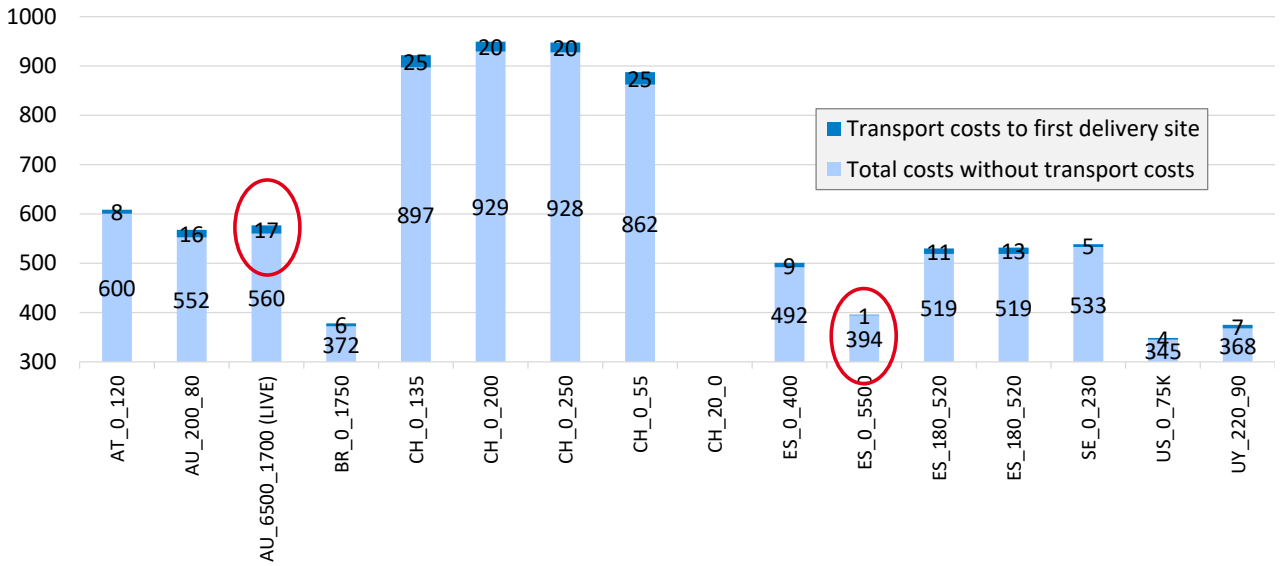
- However, as a) we usually do not know which is the final destination of the cattle produced, b) the transport cost to first delivery site are relatively low and c) the collection of transport data is a substantial effort, *agri benchmark* partners jointly decided to not continue this exercise in a regular manner. However, we will do transport cost analysis on demand and for specific analysis.

Figure 17 Transport costs to first delivery site



Source: Own calculations

Figure 18 Total costs and transport costs to the first delivery site (USD per 100 kg carcass weight)



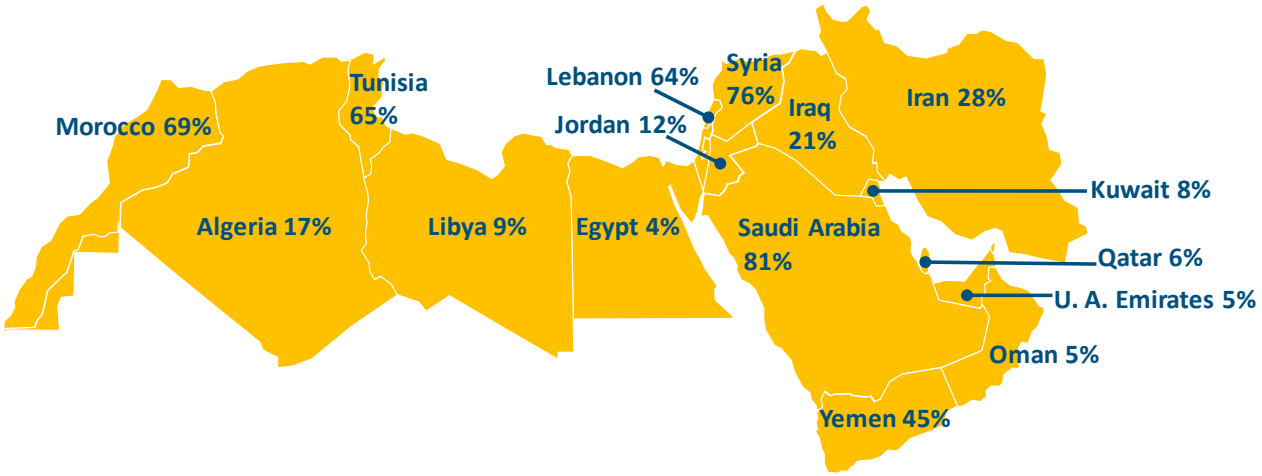
Source: Own calculations

4.2 The significance of MENA countries and Halal slaughter

The MENA (Middle East and North Africa) region is of increasing significance for beef and sheep meat.

- The MENA countries belong to the regions with the highest global population growth. Half of MENA population is concentrated in three countries, Egypt, Iran and Algeria where the percentage of agricultural land is relatively low as shown in Figure 19. In those countries with a higher proportion of agricultural land, most of the land consists of (marginal) permanent native grasslands with very low productivity. Further, desertification and degradation of pasture and rangelands are widespread.
- With few exceptions, most of the MENA countries are characterised by arid and semiarid nature. Average rainfall in the region is among the world's lowest with high your-on-year variability, contributing to unpredictable variations of agricultural yields.
- Despite regional conflicts and variations between countries, the MENA as a whole displays reasonable economic and per capita income growth rates.

Figure 19 Proportion of agricultural land in total land in MENA countries 2016



Source: FAOStat 08.2018

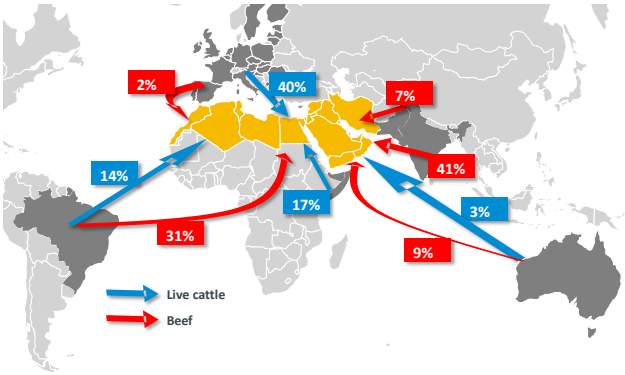
This situation makes the region an attractive target for agricultural exports, among them beef and sheep meat as well as live animals. Figure 20 shows the most important origins of these products and their proportion in the total imports.

- The bulk of beef imports to the MENA region comes from India and Brazil, mostly frozen bone-out beef and lean cuts of beef / buffalo meat. Australia and the EU only play a minor role in this. When it comes to live cattle, Europe, Brazil and Somalia are the main origins of live cattle imports to the region.
- The majority of the sheep meat imports to the region comes from Australia, New Zealand and India. Live sheep imports mainly originate from Sudan and Somalia and only 19 percent from

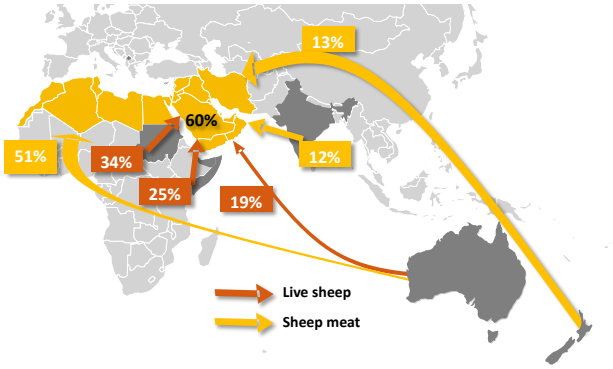
Australia. 60 percent of the imported live sheep go to Saudi Arabia in the context of the Hadj pilgrimage.

Figure 20 Main origins and percentage of beef and sheep meat as well as and live animal imports (average 2014-2016)

Beef and live cattle



Sheep meat and live sheep



Source: UNComtrade 08.2018

When sending meat products to the region, the exporters have to comply with the requirements of Halal-conform slaughter methods. There are different methods with different implications for animal welfare and the acceptance by the Muslim community. Figure 21 summarises the three most common and discussed methods.

Figure 21 Halal slaughter methods

	Conventional Halal slaughter	Post-cut stunning	Reversible (head-only) electrical pre-cut stunning
Muslim consumers	✓✓✓	✓✓	✓✓
Animal welfare	×××	✓	✓✓

Source: Own illustration based on AHDB https://www.youtube.com/watch?v=wuFXgM-IBno

- The *conventional Halal slaughter* or non-stun slaughter based on the principle of animals to be alive at the time of slaughter and all flowing blood must be drained out of the carcass. This method shows the highest acceptance by the Muslim consumer but is unacceptable from an animal welfare perspective in the majority of the countries of origin.
- The *post-cut stunning* where the animals are stunned immediately after throat has been cut. From the point of view of animal welfare, it is capable of reducing or shortening the stress caused by slaughter without stunning. On the other hand, animals are still alive at the moment of slaughter but some Muslim communities ask to determine a minimum interval between the cut and the stunning of 12-15 seconds. In most countries of origin it is not accepted or only with exceptions.

- Finally, the *electrical head-only pre-cut stunning* can be done by two electrodes on the animal head with current flow (1-2 seconds of 1.0 Ampere for sheep, 2-4 seconds of 2-3 Ampere for beef) through the brain. Such stun is sufficient to make the animal unconscious during the subsequent cut and thus it is more acceptable from an animal welfare point of view. On the other hand, the electrical stunning is fully reversible. The stunning effect ends after approximately 25 seconds in sheep and after 30-90 seconds in cattle. This ensures that the animals die from blood deprivation, and not from the electric shock. Therefore, this method was becoming more acceptable from the Muslim countries as long as the cutting is done immediately after the stunning. This method is performed as a large scale commercial operation particularly for sheep in most of the exporter countries to MENA such as Australia, Ireland, New Zealand and the UK. The other electrical stunning methods "Head to brisket" or "Head to body" where the heart of the animal is in the current pathway causing cardiac arrest are not reversible and thus are not accepted by the Muslim community.

4.3 Perspectives of beef and sheep production

The *agri benchmark* Network working lines have been mainly focused in describing and explaining the status quo and the past development of the sectors, by measuring, calculating and comparing production systems economics by regions and countries. This has been done by using standard methodologies developed by the Thünen Institute and improved continuously in cooperation with the network partners.

Nevertheless, during last conferences, partners and *agri benchmark* team members have been discussing the potential for providing an important step ahead in the analysis of information, by adding to the current discussion, the future perspectives of beef and sheep sectors. For this purpose, a workshop was prepared in terms of different approaches, calculations and results and inputs discussed with the partners. The main results are explained in the following.

First, it was decided to **not** start competition with other institutions like FAO/OECD, FAPRI and others by trying to forecast future production or prices. The reason is that *agri benchmark* cannot rely on the required model tools and – more important – this would impose an additional burden on the *agri benchmark* partners.

Second, it was decided to **not** focus on short-term price projections of one or two years due to the volatility of the markets and seasonal ups and downs as well as impacts of political decisions, for example on trade restrictions.

Instead, it was decided to remain with the analysis on farm level and to explore two ways of perspective analysis:

1 Short-term update of the Result Data Base in the current season

Our conferences usually take place in June. Our data are from the previous calendar year. The idea is to update the Result Data Base from the previous year using the latest available monthly key input and output prices from individual country statistics. As statistics in some countries are available until May of the current year, this would provide a *'close-to-mid-year'* update.

- Key variables will be: beef price, livestock price, feed price(s), machinery and building indices, wage levels and possibly an aggregated index for the remaining inputs.
- We are aware that a monthly update of prices and costs makes more sense for large farms with a continuous input and output of animals, such as feedlots with thousands of animals. However, they might serve as an indication about the tendencies of returns, costs and profits.

In this sense the value of the exercise for smaller farm units with a less regular exchange of animals shall be evaluated. Based on the discussion and evaluation of the results it shall be decided whether to continue or not.

2 Medium-term outlook

The second-part of the analysis shall focus on medium-term projections of prices and markets such as the annually updated FAO/OECD Outlook. The advantage of the FAO/OECD Outlook is that a) it has global coverage but with some country-specific details, b) like the *agri benchmark* data base, it is updated every year at a moment in time which is ideal to apply it to the consolidated Result Data Base in the middle of the year, c) it has a 10 years projection horizon which reflects the fundamental drivers and takes out the short-term noise of markets and prices and d) it is widely accepted.

The following analysis steps are planned:

1. The *agri benchmark* farm data shall be projected using the price and cost projections from FAO/OECD outlook figures. For each item, an index for the target year of the projection based on the latest available year from *agri benchmark* shall be calculated. This is typically the previous year, i.e., in the year 2018, we have 2017 data. Thus, the index would compare 2026 with the 2017 figures.
2. For those countries where national / regional projections exist (for example EU, Australia, US), these shall be made available for the projections as we can expect a more detailed reflection of national data. These have to be crosschecked with the FAO/OECD projections to avoid disruptions with the other countries where national projections do not exist.
3. To perform all these steps, a tool shall be developed that allows flexible use of FAO/OECD (and comparable) as well as national / regional projections and which will be linked to the existing *agri benchmark* model framework.

These exercises will commence in the 2019 season of the network. Results will be prepared, discussed in the conference and afterwards published.

5 References

FAOStat: http://www.fao.org/faostat/en/#home

FAO Meat price index: http://www.fao.org/economic/est/est-commodities/meat/en/

FAO/OECD Outlook: http://www.agri-outlook.org/

UNComtrade: https://comtrade.un.org/db/default.aspx


GALWAY, WEST OF IRELAND 2018
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16th agri benchmark
Beef and Sheep Conference 2018
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chanelle
Bord Bia
Irish Food Board
JOHN DEERE

http://www.agribenchmark.org/beef-and-sheep/farm-information.html

Location of the typical farms (for watching on the website)
Glossary of terms (for download)
Conceptual background information (for download)
Farm profiles (for download)

http://www.agribenchmark.org/agri-benchmark/value-and-approach.html

Standard operating procedure to define typical farms (for download)

the *agri benchmark* project

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