

International Fleckvieh Magazine
presented by FLECKVIEH AUSTRIA

Issue 3 | August 2022



FLECK VIEH CHANGES



Robust
WSFC 2022
Special topics

Efficient
Top farms &
Insemination Centers

Sustainable
Breeding value estimation
August 2022

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Aim of the magazine

Information for international cattle breeding through reports, contributions from science and practice, announcements, and tips.

Responsibility

Responsible for the content is the respective author. The articles and contributions drawn by name represent the personal opinion of the author and do not have to agree with the opinion of the »Fleckvieh Austria«.

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Welcome

It is indeed an honor to welcome each of you to the WSFF World Congress in Austria; the first time that we have been together since 2018. The Austrian Simmentaler Association has done a great job in preparation for this event, and they welcome you to Austria also.

The World Simmental Fleckvieh Federation is composed of 25 member countries, with 45 different herd books that represents 2,300,000 Simmental Fleckvieh animals; formed September 24th, 1974 and it is the only World, Breed specific society that has the goals listed in it's mission statement.

The WSFF Mission statement

The federation aims at the promotion of the breed by means of

- A co-operation between breeder organizations
- The establishment of common breeding rules
- The exchange of information
- The comparability of pedigrees and of test results
- The establishment of guidelines for the acknowledgement of pedigrees publicity

The Simmental, Fleckvieh breed, is by population the second largest Bovine population, in the world, second only to the INDU cattle, that is made up of various types including Brahman and Nalore as well as others. The complexity and adaptability of the Fleckvieh Simmental breed has allowed it's growth to virtually every continent of the world. The use of these genetics, in the pure form, or through cross breeding to meet environmental and economic importance has established the tremendous use of this gene pool.

So, what is the importance of the World Simmental Fleckvieh Federation?

Looking at the numbers, you can see, that there is a huge distribution of Fleckvieh cattle, that are represented by the 25 member countries that make up the WSFF. The wide range of conditions and different types of cattle make it important that members come together periodically to: exchange ideas and opinions; on an international level, for the positive development of the Simmental cattle breed. The WSFF World Congress, held every two years, and the technical meetings, held the other years, allows for this to happen.

The cattle business has become a world market and the Congress allows Simmental to become center stage in that market, place. The ideas presented at the Congress, both formal and informal, allows for breeders and breed societies to see what is working under different climate and management techniques. The use of DNA, to advance the breed, has become the tool of the future and we must stay ahead of the curve to continue our position in the world market.

On behalf of the WSFF and its Board of directors; we welcome you to this special event for Simmental and their breeders. Enjoy the program, visit with other breeder's and enjoy the hospitality and great cattle while in Austria. A special thanks to the Austrian Society for planning and implementing such a great event.



Fred Schuetze
President of the WSFF

Dear Participants

After a long break and repeated changes to the congress date due to external circumstances, we again have the opportunity to meet in person at the Congress of the World Simmental Fleckvieh Federation, which is being hosted by Fleckvieh Austria. This year's motto "A grand showcase at just the right time" was impossible to miss when registering for the congress. In my opinion, the congress organisers could not have chosen a better statement.

Looking at the carefully prepared congress programme, I am convinced that it will offer an unforgettable combination of the best of culture and agriculture that the Alpine nation of Austria has to offer.

During our farm visits, we will be able to see the results of decades of careful breeding work in Fleckvieh and the passion and commitment of Austria's breeders, which will give us a glimpse behind the scenes of their outstanding success. The quality of breeding work will also be on display during the absolute highlight of the entire congress, the National Fleckvieh Show in Freistadt with more than 150 exhibited animals, a premium cattle auction, the presentation of progeny groups and the next edition of the international FleckScore World Cup.

More than 200 registered participants from 30 countries around the world confirm my belief in the well-prepared and balanced programme of the congress, which could not start anywhere else than in the beautiful city on the blue Danube – Vienna. From there, the programme will take us to other parts of Austria, where we will have the opportunity to learn more about Austrian Fleckvieh breeding at some of the more than 14,000 farms listed in the Fleckvieh Breeders' Register. It will definitely be exciting to see what topics the Austrian breeders, who keep the majority of their herds – 73 per cent – in disadvantaged areas, are interested in. Personally, I am convinced that we will hear a lot about longevity, fertility, udder health, calving ease, vitality, persistency and milking speed – the fitness traits with the greatest economic weight in the total merit index.

At more than 310,000 registered herdbook cows, the Fleckvieh population in Austria is the second largest in the world, with an average milk yield of 7,800 kg in the last reference year.

It is wonderful that the organisers have not forgotten our young breeders either, for a great programme is being prepared, with the possibility of active participation in the FleckScore World Cup.

As I already mentioned, the programme is designed to strike a balance between professional and social elements. The formal reception at the Vienna City Hall complete with a gala dinner will certainly be one of the unforgettable highlights of this year's congress, but so will the dinner in true Austrian style at a traditional "Heuriger" restaurant in Vienna.

I wish all congress participants an unforgettable experience, many new professional inspirations, friendly encounters with members of the big "world Fleckvieh family" and the opportunity to discover at least a little bit of this year's Alpine host country.



Dr. Josef Kučera
President of the EFV

Fleckvieh changes!

Under the motto “Fleckvieh changes”, people from across the world are coming together to exchange their experiences on the occasion of the World Simmental Fleckvieh Congress in Vienna. It fills us with pride, but above all with joy, that Austria has the special privilege of being the host this time. 75 per cent of Austria’s nearly 2 million cattle belong to the Fleckvieh breed. Relatively speaking, we are thus the country with the most Fleckvieh cattle in the world.

The breed has developed enormously and made great progress in recent years. This has only been possible thanks to the close links between science and practice worldwide. More than ever before, Fleckvieh is in step with the times, as proven by numerous studies and scientific results. This is precisely the topic of the lecture series organised on the occasion of the congress. These presentations will be complemented by interesting excursions to breeding farms to highlight the ability of practitioners to implement the findings of science.

The congress offers participants from all over the world an opportunity to exchange experiences and news. At the global level, there are major challenges ahead, especially for the agricultural sector. Tackling the climate crisis and ensuring food security while taking into account the fact that the majority of agricultural lands consist of pasture and meadows, which the ruminant stomach can utilise in an optimal way, are at the top of the list. At the World Simmental Fleckvieh Congress, we want to get together to discuss the opportunities offered by the specific advantages of our breed. With “Fleckvieh changes” as the motto, there is no need for us to indulge in superlatives. A sober look at the possibilities, both economically and ecologically, show us that we are on the right track. For us it is a special honour and pleasure to create a space for exchanges of information, consultations and discussion at the congress in Vienna.

The discussions will certainly be very exciting during the excursions to our member farms, where we want to illustrate that Fleckvieh delivers in practice what it promises in theory. The exchange of experiences through talks by practitioners from farms across the world is a special part of our congress programme.

“The Congress is dancing, but it does not move forward” was a famous quote on the occasion of the Congress of Vienna of 1814/15, which was of such importance for the political reorganisation of Europe. The World Simmental Fleckvieh Congress will demonstrate that Fleckvieh breeders are on the right track for the future.

Besides the technical contributions, we also want to showcase Austria’s cultural side. Alongside the professional highlights, the evening events and alternative programmes as well as the post-congress tour are intended to offer participants a cultural experience and the opportunity to get to know our country in all its diversity.

I would like to thank the team of Fleckvieh Austria, our sponsors as well as the Austrian Ministry of Agriculture for their support and for enabling us to manage this huge organisational task. I wish all congress participants plenty of new information, many pleasant encounters and a memorable stay in Austria.



Ing. Sebastian Auernig
Chairman of Fleckvieh Austria

Welcome to the WSFC, Austria 2022

Dear breeders, delegates and friends of Fleckvieh breeding! As Federal Minister, I am especially committed to promoting the future of Austrian agriculture. The World Simmental Fleckvieh Congress is a great opportunity to facilitate a lively, international exchange of knowledge between breeders and to build networks among them. It thus plays an important role for the experts and practitioners of Fleckvieh breeding. It is with great pleasure and pride that I welcome the World Simmental Fleckvieh Congress back to our beautiful country after more than 25 years.

Much like the international cattle industry, our Austrian family farms, especially those active in cattle breeding, are facing significant challenges due to growing pressure on the market as well as changes in the underlying conditions – just to mention climate change as an example. The production of high-quality milk and beef is of great importance for Austria’s small-scale farming sector. Since almost 60 per cent of our agricultural land is grassland, cattle farming and milk production are the most important branches of agricultural production. Alongside pig farming, cattle husbandry accounts for a significant part of Austria’s total agricultural production, with about 1.9 million animals and more than 55,000 farms. Austrian cattle farming is divided into two sectors: specialised cattle fattening, which mainly takes place in regions with crop farming, and dairy farming on grassland. Traditionally, the Austrian beef market boasts a very high level of self-sufficiency of around 140 per cent. Like other sectors, dairy production in Austria is also characterised by small-scale, pasture-based family farms with 20 cows on average. 75 per cent of dairy farms operate in mountain areas and thus contribute to the optimal utilisation of our vast grassland areas.

The World Simmental Fleckvieh Congress and the National Fleckvieh Show cover the whole of Eastern Austria, starting with the congress in Vienna and ending with the National Fleckvieh Show in Freistadt. The programme features a number of extremely interesting events: the General Assembly of the World Simmental Fleckvieh Federation (WSFF), the General Assembly of the European Simmental Federation (EVF), visits to top Fleckvieh breeding farms in several federal states, the bull presentations in Lower Austria and Upper Austria, and finally, the National Fleckvieh Show in Freistadt.

The final highlight of the official programme is definitely the National Fleckvieh Show. It provides excellent insights into the success of Fleckvieh breeding in Austria, where it is by far the most widespread cattle breed. The international audience can witness the results of the work of Austria’s breeders 365 days a year, which has been driven by their care for the animals entrusted to them. As is customary in Austria, the show will not only be characterised by competition, but also by a sense of community, joy and excitement.

I wish all participants many interesting discussions and a great congress! I would like to extend a big thank you to the breeders and Fleckvieh Austria for their work and for organising the congress as well as the show and wish them continued success.



Mag. Norbert Totschnig, MSc.
Minister for Agriculture





FLECKVIEH CHANGES

**The world is our
guest in Austria!**

ING. REINHARD PFLEGER, FLECKVIEH AUSTRIA – VIENNA, AUSTRIA

Dear managers and breeders
from around the world,
dear members of the extended
Fleckvieh family,



World Simmental Fleckvieh Congress &
National Fleckvieh Show – Austria 2022
A magnificent showcase at the right time

On behalf of Fleckvieh Austria and the World Simmental Fleckvieh Federation (WSFF), we would like to welcome you to Austria. We are proud that we have been able to organise two outstanding events in Fleckvieh breeding with the World Simmental Fleckvieh Congress and the National Fleckvieh Show.

After more than 25 years, Austria is once again hosting the World Simmental Fleckvieh Congress. The technical and cultural highlights of the first part of the congress will take place in and around the capital city of Vienna.

We want to offer our international guests a high-calibre event programme of specialist lectures on future topics regarding our breed, visits to Austrian family farms who are passionately committed to breeding Fleckvieh and provide opportunities for interpersonal exchange in culture and culinary arts.

We will then move on to Linz and Freistadt, where we will present the country's best and most beautiful Fleckvieh cows to a national and international audience at the National Fleckvieh Show during the weekend of 3 and 4 September. Saturday

evening, a first-class elite auction and the new edition of the FleckScore World Cup will enrich the programme of the National Fleckvieh Show with the selection of the national prize-winners.

For our international guests, particularly those from the more distant parts of Europe and from other continents, the Post-Congress AGROTOUR in various breeding regions in Austria offers the opportunity to become more closely acquainted with the breeding farms, culture and nature of our homeland after the National Fleckvieh Show.

What do we want to show the world? With respect to the country-specific percentage of breeds, Austria has the greatest quantity of Fleckvieh in the world and is on a successful path. We have seen positive developments in almost all our breeding parameters. Major progress has been made in the performance of the animals, which was and is an important factor for the international visibility of Austrian Fleckvieh cattle. At the same time, the economically sound evaluation of the total breeding value has enabled us to maintain the breed's core strengths in udder health, fertility and robustness.

Fleckvieh – The cattle breed of the future – dual-purpose in perfection

Its suitability for dual-purpose use is the breed's true trump card. The ability to combine dairy and meat products in a pure-bred animal is an economic aspect that clearly speaks in favour of Fleckvieh cattle. The option to use animals that are not needed for breeding to produce high-quality beef is part of the solution to the current sustainability and environmental efficiency challenges. The fact that the promotion of dual-purpose cattle and poultry has, for the first time, also become government policy in Austria confirms that the Fleckvieh breed is also on the right track in terms of public perception.

Fleckvieh Changes – Fleckvieh changes the world of cattle!

As the host country of the World Simmental Fleckvieh Congress, we want to exhibit the cited economic and ecological advantages of our Fleckvieh. At the same time, the focus will also be on global megatrends and their impact on cattle breeding and agriculture as a whole.

On one hand, global challenges, such as digitalization and the associated accelerated development of new technologies, are now affecting all sectors. On the other hand, we experience the controversial discussion on

the climate impact of cattle from the social perspective.

By choosing "Fleckvieh Changes" as the motto of the Congress, we want to show that we are not only aware of the challenges, but that we can also offer convincing answers. Fleckvieh is changing the world of cattle, as it enables dairy farming with robust, pure-bred cows and is the most eco-efficient form of livestock production.

The Austrian way

On average, the Austrian Fleckvieh cow births more than four calves in her lifetime. Fleckvieh thus leads the international rankings of cattle breeds in terms of longevity, sustainability and efficiency. And with genomic selection, we have a modern tool for cattle breeding at our disposal. Our consistent efforts to implement the joint breeding programme have been the logical consequence here. In particular, the progress has been reflected in the fitness traits, and, in future, we also expect to see a significant impact with regard to new traits such as hoof health, metabolic stability, feed efficiency or the environmental effect of the cows.

"Fleckvieh Changes" also applies in the sense that what we, in contrast to others, continue to see this as advantageous regarding the prospects of keeping high-level breeding in the hands of farmers and of being able to implement a holistic breeding strategy. This is only possible through consistent breeding efforts and the consistent use of relevant modern techniques. Effective genome selection requires that the breeding population be as large as possible, which in turn makes intensive international cooperation essential.

One of the goals of the World Simmental Fleckvieh Congress in Austria also involves strengthening international cooperation and propagating the successful genetics of Austrian Fleckvieh cattle worldwide.

To a successful World Simmental Fleckvieh Congress 2022 in Austria with unforgettable impressions, professional motivation and many friendly encounters! ☺



Ing. Sebastian Auernig
President



Ing. Reinhard Pflieger
Director

FLECKVIEH AUSTRIA

*Your host for the World Simmental
Fleckvieh Congress 2022*

ING. REINHARD PFLEGER, FLECKVIEH AUSTRIA – VIENNA, AUSTRIA

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Fleckvieh Austria represents the interests of the Austrian Fleckvieh breeders and their 11 member associations.

FLECKVIEH AUSTRIA	Year 2021
Population size	1,397,682
Herd book cows	310,105
Breed share of herd book cows	75.1 %
Breeding herds	14,173
Ø Herd size	21.8 cows
Ø Milk production	7,801 – 4.17 – 3.44 – 594
Ø Lifetime performance	32,112 kg
Ø Intercalving period	391 days
Ø Number of somatic cells	186,716
Proportion of genotyped animals in the total population	11.1 %
Proportion of inseminations with naturally polled bulls in total inseminations	27.0 %
Number of linear descriptions with FleckScore	27,729

Breeding goal of Fleckvieh Austria

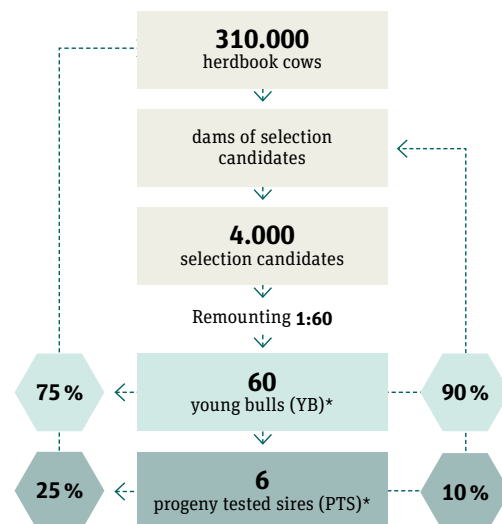
The breeding goal is to achieve a lasting improvement in the profitability of milk production with a balanced consideration of beef production and, above all, fitness characteristics. This goal is achieved most efficiently by selection on the basis of the total economic breeding value (GZW).

TRAITS	Weighting in total merit index in %
MILK	38
Milk kg	0
Fat kg	18.6
Protein kg	19.4
BEEF	18
Daily gain	4
Carcass percentage	7
EUROP Trade class	7
FITNESS	44
Longevity	10
Persistency	3
Fertility	14
Maternal calving ease	1
Calf vitality	5
Udder health	10
Milking speed	1

Breeding programme in Fleckvieh Austria

The Fleckvieh Austria breeding programme is the heart of Fleckvieh Austria's work. The genome-based breeding programme serves to achieve breeding progress quickly and efficiently for the purpose of the breeding goal. The active and targeted use of young genetics has a very positive effect, particularly in the fitness area. It also ensures a broad range of blood flow and enables an even more efficient successful selection of genetic peculiarities such as natural polledness.

FLECKVIEH AUSTRIA – Breeding program



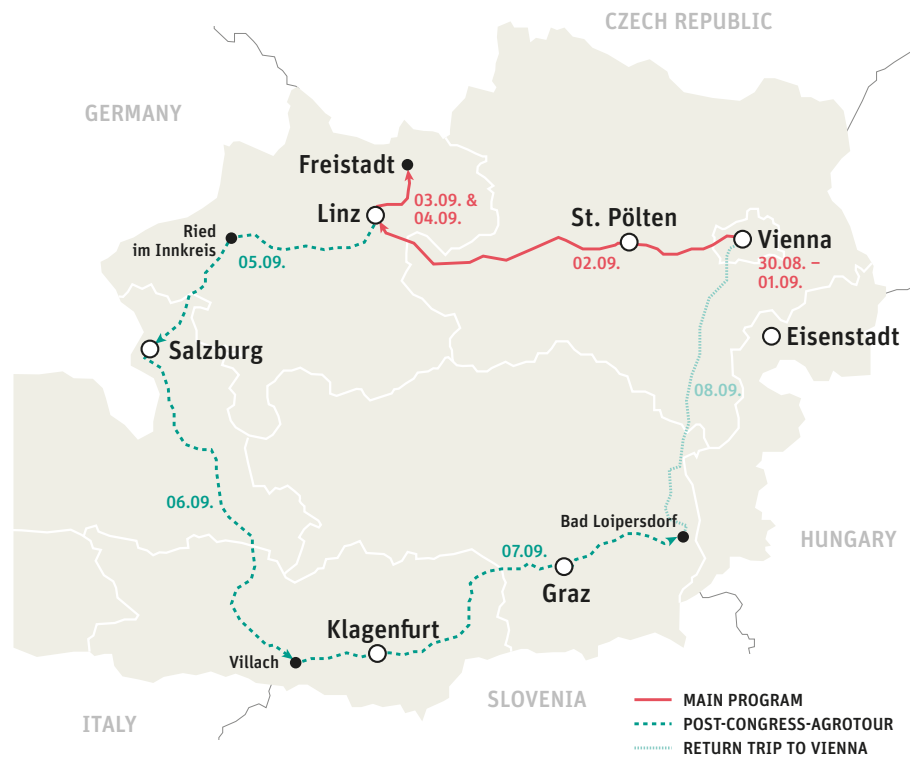
* additional use of foreign genetics
Rinderzucht Austria / Kalcher-06-2022

World Simmental Fleckvieh Congress & National Fleckvieh Show Austria 2022

Programme overview

After more than 25 years, Austria will again host the World Simmental Fleckvieh Congress, from August 30th to September 4th, 2022. The main conference venue is the Parkhotel Schönbrunn in Vienna. This means that the professional highlights of the first part of the congress (from Tuesday to Friday) will also take place in the Vienna region. We will then move on to Linz and Freistadt, where we will present the country's finest Fleckvieh cows to a national and international audience at the National Fleckvieh Show during the weekend of September 3rd and 4th. A premium auction, a young breeder's event, and the next edition of the FleckScore World Cup are planned for Saturday evening.

For our international guests, especially those from more distant parts of Europe and from other continents, we have planned a Post-Congress AGROTOUR of various parts of Austria. Until September 8th, our guests will thus have the opportunity to visit other leading Fleckvieh breeding farms. In addition, Austria's culture and nature will also feature prominently.



Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
08/30	08/31	09/01	09/02	09/03	09/04	09/05	09/06	09/07	09/08
World Simmental Fleckvieh Congress						Post-Congress-Agrotour			
			National Fleckvieh Show						

MAIN PROGRAMME – 08/30 – 09/04/2022 – Vienna / Linz / Freistadt

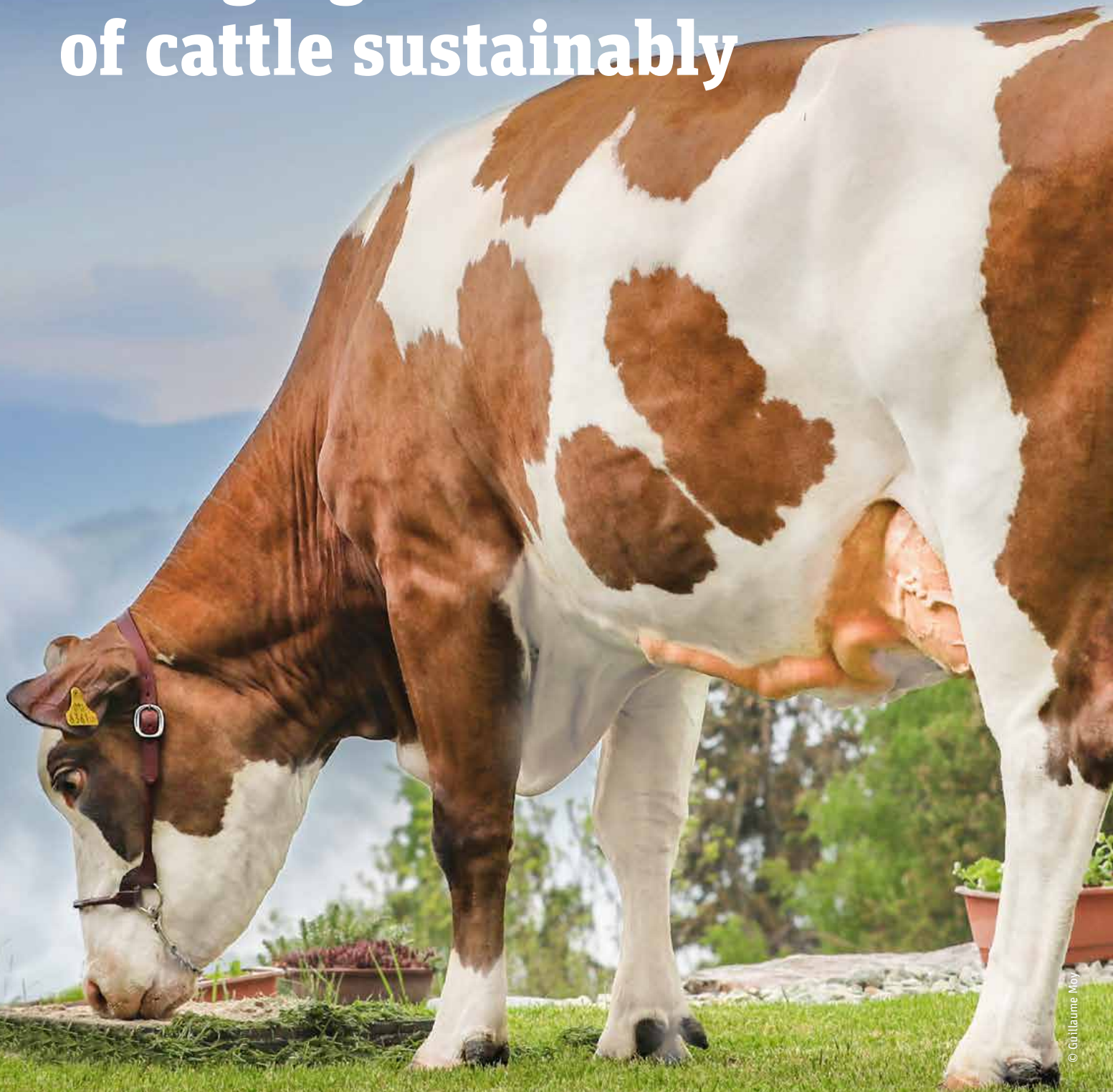
Day	Date	Planned time	Programme	City	
Day 1	Tuesday	08/30	09:00–17:00	Arrival & registration at Parkhotel Schönbrunn	Parkhotel Schönbrunn
			Afternoon	Board meeting of the World Simmental Fleckvieh Federation WSFF (only with separate invitation)	Parkhotel Schönbrunn
			Evening	Reception with opening of the WSFF Congress with the presentation of the countries	Parkhotel Schönbrunn
				Gala dinner in the ballroom of Parkhotel Schönbrunn	Parkhotel Schönbrunn
Day 2	Wednesday	08/31	Morning	Option 1: General assembly of the European Simmental Fleckvieh Federation (EVF)	Parkhotel Schönbrunn
				Option 1: The EVF “Fleckvieh Changes” conference with 3 presentations (Programme: see page 14–19)	Parkhotel Schönbrunn
				Option 2: Guided city tour in Vienna with a visit to the Spanish Riding School	Vienna
		Afternoon	Excursion 1 – Dual-purpose Fleckvieh: Breeding farm LFS PYHRA, 3143 Pyhra (top genetic herd) + PERSCHLINGTAL MILCH Gesnbr., 3143 Pyhra (largest Fleckvieh breeding farm in Austria)	Pyhra	
		Evening	Austrian evening at a traditional “Heurigen” (wine tavern) in “Fuhrgaschl-Huber”	Vienna	
		Day 3	Thursday	09/01	Morning
	The WSFF “Fleckvieh Changes” conference with 6 presentations (Programme: see page 20–33)				Parkhotel Schönbrunn
Afternoon	Excursion 2A – Dual-purpose Fleckvieh: Breeding farm Milchhof STEINER, 2560 Hernstein (top genetic herd)			Hernstein	
	Excursion 2B – Fleckvieh beef: Fattening farm ROCH Markus, 3434 Tulbing (Fleckvieh bull fattening, beef tasting, biogas production)			Tulbing	
	Excursion 2C – Fleckvieh beef: Breeding farm Fleckvieh Pure Beef FRÜHWALD Roland, 3442 Langenschönbichl (Fleckvieh suckler cows, beef tasting)			Langenschönbichl	
Evening	Gala dinner at the Arkadenhof in the Vienna City Hall			Vienna	
Day 4	Friday			09/02	08:00–09:30
		Morning	Bull presentation 1: GENOSTAR Rinderbesamung GmbH, 3244 Ruprechtshofen (presentation of top insemination bulls)		Ruprechtshofen
		Afternoon	Hotel check-ins in Linz and leisure time in Linz		Linz
		Evening	Boat cruise on the Danube in Linz with gala dinner and closing ceremony		Linz
Day 5	Saturday	09/03	Morning	Bull presentation 2: OÖ BESAMUNGSSTATION GmbH, 4921 Hohenzell (presentation of top insemination bulls)	Hohenzell
			Afternoon	Excursion 3A – Dual-purpose Fleckvieh - Breeding farm GRUBER Markus, 4372 Sankt Georgen am Walde (top-technicalised Fleckvieh breeding farm)	St. Georgen an Walde
				Excursion 3C – Fleckvieh beef – Breeding farm Fleckvieh Pure Beef KREIL Raimund, 4952 Weng im Innkreis (Fleckvieh suckler cows, bull breeding)	Weng im Innkreis
			Evening	Dinner for all congress participants with beef specialties at the National Fleckvieh Show	Freistadt
				NATIONAL FLECKVIEH SHOW 2022 in Freistadt (FleckScore World Cup, offspring presentations, elite auction)	Freistadt
Day 6	Sunday	09/04	07:30–08:15	Hotel check out in Linz	Linz
			All-day	NATIONAL FLECKVIEH SHOW 2022 in Freistadt	Freistadt
			16:30–19:00	Bus return transfer from Freistadt to Vienna or Linz	Linz/Vienna
Day 7	Monday	09/05	09:00–12:00	Bus return transfer from Linz to Vienna	Vienna

POST-CONGRESS-AGROTOUR – 09/05 – 09/08/2022

Day	Date	Planned time	Programme	City	
Day 7	Monday	09/05	All-day	Post-Congress-Agrotour – from Upper Austria to Salzburg	Upper Austria
Day 8	Tuesday	09/06	All-day	Post-Congress-Agrotour – from Salzburg to Carinthia	Salzburg
Day 9	Wednesday	09/07	All-day	Post-Congress-Agrotour – from Carinthia to Styria	Carinthia
Day 8	Thursday	09/08	All-day	Post-Congress-Agrotour – from Styria to Vienna	Styria

PRESENTATIONS

**How Fleckvieh is
changing the world
of cattle sustainably**



PRESENTATIONS – Wednesday, 08/31/2022

General assembly of the European Simmental Fleckvieh Federation (EVF) and conference with international speakers in the ballroom of the Parkhotel Schönbrunn Vienna

8:30 am–10:00 am EVF General Assembly
10:30 am–11:45 am Conference with presentations

Topics and speakers

-
1. **FleckScore – A successful system for healthy and durable cows**
Speaker: Bernhard Luntz, Bavarian Regional Office for Agriculture (LfL Bayern), Germany

 2. **Current developments on meat quality in Simmental Fleckvieh cattle**
Speaker: Mathias Gerber, Mutterkuh Schweiz, Switzerland

 3. **Digitalization – Possibilities and challenges for cattle breeding**
Speaker: Dr. Christa Egger-Danner, ZuchtData, Austria

PRESENTATIONS – Thursday, 09/01/2022

General assembly of the World Simmental Fleckvieh Federation (WSFF) and conference under the motto “Fleckvieh Changes – How Fleckvieh is changing the world of cattle sustainably” with international speakers in the ballroom of the Parkhotel Schönbrunn Vienna

8:00 am–9:30 am General Assembly of the WSFF
10:00 am–1:15 pm Conference with presentations

Topics and speakers

-
1. **Austrian agriculture and cattle breeding – Chances and challenges**
Speaker: SC DI. Johannes Fankhauser, Federal Ministry of Agriculture, Forestry, Regions and Water Management, Austria

 2. **Fleckvieh breeding in Austria – Fit for the future**
Speaker: Dr. Christian Fürst, ZuchtData, Austria

 3. **Future Fleckvieh – From traditional breeding to gene editing**
Speaker: Prof. Dr. Johann Sölkner, University of Natural Resources and Life Sciences, Austria

 4. **Modern Fleckvieh breeding – What changes are required for breeding programs**
Speaker: Prof. Dr. Kay-Uwe Götz, Bavarian Regional Office for Agriculture (LfL Bayern), Germany

 5. **Dual-purpose cattle breeds as a success factor for sustainable dairy and beef production**
Speaker: Dr. Stefan Hörtenhuber, University of Natural Resources and Life Sciences, Austria

 6. **International developments in the breeding of Simmental cattle for beef**
Speaker: Bruce Holmquist, Canadian Simmental Association, Canada



FLECKSCORE

A successful system for healthy and durable cows

BERNHARD LUNTZ, BAVARIAN STATE RESEARCH CENTER FOR AGRICULTURE (LFL BAYERN) – POING, GERMANY

After about two years of development, the FleckScore rating system was approved for practical use in autumn 2011. The country representatives from Germany, Austria, Italy and the Czech Republic converted the previous 9-grade system to an international scale. The aim was partly to examine the data used by the respective countries in terms of their impact on longevity, for which the experts' professional assessments of the evaluations were also compared. More than 100,000 linear descriptions finally led to the calculation of a proposed score for the main characteristics of frame, feet & legs and udder. The lactation number of the cows was also taken into account.

After some initial scepticism, the new system was introduced and explained in numerous training sessions. In addition, the close cooperation and trust established during the annual meetings of the EVF's Conformation Working Group have resulted in the full acceptance of FleckScore. Taking into account the scatter in the traits to produce meaningful breeding values was also always an essential element. Additional fine-tuning, such as restrictions and definitions of defects, further supplemented the practical applicability of FleckScore. FleckScore thus acted as an example for other breeds.

Beautiful cows also live longer

Animal welfare and health play an essential role, especially in the current climate.

Cows that have a long useful life are also an essential factor for cost-effective milk production. FleckScore meets both these requirements. The collection of health data, which has been integrated in the cross-national breeding value estimation system for several years, proves the connection between conformation and stable health in cows. The conformation breeding values are therefore also used as auxiliary traits for fitness-related characteristics. The International Committee for Animal Recording (ICAR) emphasises this in its latest recommendations.

Every system, no matter how good, should be reviewed after a certain period of time. This year, all traits were repeatedly examined according to their importance for

longevity. The dataset used for this purpose consists of 200,000 evaluated cows (2006 to 2010 birth cohorts) in the partner countries of the joint breeding value estimation. A very encouraging result is the increase in longevity compared to the previous evaluation. Despite a significant increase in milk yield, Fleckvieh cows live 30 days longer today than they did 11 years ago. This is certainly also due to the increase in conformation quality. However, it has also been shown that most of the indices for the main scores are still in agreement. This indicates that the path we have taken so far is the right one. In the course of the review, some defects of minor importance were removed, while other defects were redefined and added. Based on these findings, further adjustments will be made next year, with the decision to be taken by the country representatives in the EVF working group.

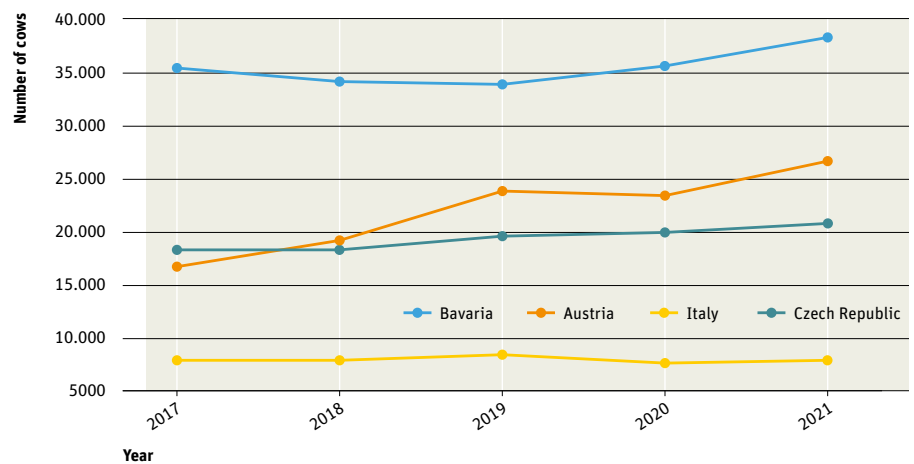
FleckScore – a guarantee of reliable breeding values

The regular evaluations carried out in the countries participating in the joint breeding value estimation show a high degree of consistency in the population analyses. Many practical trainings and discussions on live animals have led to very harmonious results. This is confirmed by comparisons between the countries. One of the parameters is the correlation of the individual traits to the main scores. Only a few years ago, there were still considerable differences in this respect. The latest evaluation showed a consistent application of the system, so that the conformation data from the various countries are absolutely comparable. This also results in highly reliable breeding values. Furthermore, the reliability of the breeding values is also supported by the growing number of young cows that have been evaluated. For example, in 2021 the number of datasets for the breeding value estimation increased by 20,000 cows compared to 2016 (Krogmeier 2022). The expected accession of further countries to the data pool will have an additional supporting effect.

FleckScore is for everyone

Via the FleckScore website, anyone can create an evaluation with an electronic calculation of the main scores. The application is currently available in 16 different languages at www.fleckscore.com. This site is widely used all over the world. Last year, it was accessed by 32,000 visitors. In addition to linear description options, it provides up-to-date information on FleckScore and the work of the EVF expert group. By sending the evaluation results, the data can either be saved or analysed for comparisons among several users. As

Evolution of the number of cows covered by the breeding value estimation by country



a result, the website can also be used for didactic purposes. The aim is to expand the range of applications in the future. An application is in planning that will enable a real-time analysis of the results of a comparative assessment carried out by several users, which will facilitate the organisation of courses and competitions.

Outlook

In the future, Fleckvieh population analyses should continue to depict the correlation between conformation and longevity as accurately as possible. There is no doubt that the current approach is the right one. However, correlations between traits may be subject to certain changes as a result of breeding. Such developments must be identified and taken into account. An important aspect for the future is the functionality of cows in automatic milking systems (AMS). The use of these milking methods is growing rapidly across all countries, and they also require the herd to function as smoothly as possible from a breeding point of view. The demands on udder traits may differ from those in other milking systems. However, this would also require a closer look at the supporting effects of the individual traits. Today's breeding values are certainly very helpful, but not yet comprehensive. Likewise, field data from the use of AMS can help to obtain a more differentiated picture of udder traits. This is also supported by trials and analyses conducted in various studies. The advent of digitalised networking in modern animal housing facilities is a future area of activity that will certainly be beneficial for conformation as a whole. This gives rise to win-win situations, especially when it comes to determining longevity. There are also clear correlations between legs & feet and hoof conditions, which would benefit from the integration of digitalised information on the cows' move-

ment behaviour. The ultimate goal should be to exploit these mutually reinforcing effects to further improve the functionality of cows.

Summary

The introduction of FleckScore has given a significant boost to the population. By applying a highly professional and traceable system, conformation results are comparable across countries, even across continents. This enables a neutral and qualitatively comparable assessment at any time. Thanks to the higher degree of certainty, genomic procedures also benefit from phenotypic data. 🐾



Bernhard Luntz

is head of the cattle working group at the Institute of Animal Breeding at the Bavarian State Research Centre for Agriculture. He is responsible for conformation performance testing in Bavaria. He heads the European Working Group on Conformation within the EVF. Since 2021, he has served as Deputy Director of the Institute.

CURRENT DEVELOPMENTS on meat quality in Simmental Fleckvieh cattle

MATHIAS GERBER, MUTTERKUH – MONT-TRAMELAN, SWITZERLAND



Simmental provides many breeders and beef producers in Europe with excellent weaning weights, short fattening phases and thus high efficiency in the production of animals ready for slaughter. In Great Britain, Simmental has long been the breed with the lowest slaughter age. In Denmark, Simmental animals achieve growth rates of 2 to 2.5 kg per day in the fattening phase. But Simmental also exhibit leading 200-day weights in many countries, including Switzerland, where Simmental has clearly led the ranking of the weaning weights in breed comparison for more than 10 years.

High efficiency in fattening and high slaughter weights result in good revenue for the producers. Meat quality is also becoming an increasingly important issue. The demand for the best meat quality has particularly grown in the gastronomy sector but measuring meat quality is quite complex and depends on various parameters. The most important are certainly the intramuscular fat and tenderness. Not to be neglected, however, are also the juiciness and colour of the meat.

In Switzerland, the last major breed comparison concerning meat quality was already a long time ago. In 2006, the Agroscope research institute concluded that all breeds have a high standard of quality in a 6-breed comparison with the fattened oxen of the Angus, Blonde d'Aquitaine, Charolais, Limousin, Piedmontese and Simmental breeds. Simmental performed convincingly in the test, particularly in the aspects of meat colour and juiciness. In the sensory comparison for tenderness, Simmental performed slightly lower than the other breeds, although no difference could be found between the instrumentally measured tenderness compared to the other breeds. In the blind tasting, the Piedmontese breed took first place. Surprisingly, the intramuscular fat content was

significantly lower in this breed than in the other breeds.

Another experiment with fattening animals is currently underway at Agroscope in Switzerland. In this 3-breed comparison with F1 animals of the breeds Angus, Limousin and Simmental, the suitability of the different groups is tested in different production systems. Three different groups of F1 hybrids are tested in three different regions with varied feed intensities. The experiment is called Regio-Beef.

The experimental phase in the valley area with intensive feeding has already been completed, and the first results are available.

In this experiment, the performance of the Simmental hybrid animals is also slightly below that of the Angus and Limousin hybrids in terms of the tenderness of the meat. This applies to both the tasting and the instrumentally measured tenderness.

The question therefore arises whether the meat quality, and in particular the main characteristics of tenderness and intramuscular fat, should be cultivated more often.

However, the more relevant question is then how can this be achieved? Meat quality parameters are currently not systematically collected in slaughterhouses in Switzerland or in other European countries. Only a targeted and general collection of criteria such as tenderness and intramuscular fat would likely make it possible to process the data obtained in this way in a corresponding breeding value assessment.

A further problem lies in the quality payment for carcasses; if the best meat quality does not receive higher payments, the incentive for producers to breed in this direction is rather weak.

However, the current 3-breed comparison in Switzerland also shows other important aspects that should currently be considered in beef production. The F1 Simmental animals perform significantly better than the F1 Angus and F1 Limousin animals in terms of feed efficiency and in terms of methane emissions per kg of dry matter feed intake. This suggests higher levels of climate efficiency. Methane emissions are an important topic in the current social debate. Moreover, significant achievements could possibly be made here in terms of breeding.

Another aspect of beef sales and marketing that is becoming increasingly important, especially in Switzerland, is regionality.

More frequently, consumers are looking for regional products with which they can identify, and which promise a certain degree of sustainability. The Simmental breed is an excellent ambassador of these values and therefore urgently needs to be better marketed. Thanks to its dual use, this breed is ideally suited for converting grassland into high-quality and sustainable products. Due to its name and its connection to the Bernese Oberland, it is a symbol of regionality, tradition and alpine farming.

To be able to market these values better, producers, processors and marketers in Switzerland joined forces in 2018 to form the Simmental Original Association. The aim of the association is to sell Simmental products in the meat as well as the dairy and cheese sectors with added value for producers and the entire value chain. Individual products are already being offered, but important steps still need to be taken regarding the launch of a Simmental cheese made from milk from pure Simmental herds. 🍷

Information about the association and its activities can be found at www.simmentaler-original.ch.



Mathias Gerber

is a suckler cow farmer in Bernese Jura, Switzerland on a mountain farm with grasslands and a herd of around 20 Simmental suckler cows. Since 2014, the agronomist has been president of Mutterkuh Schweiz, the umbrella organisation of Swiss beef cattle farmers, which today has around 6,000 members.



DIGITALIZATION

Possibilities and challenges for cattle breeding

DR. CHRISTA EGGER-DANNER, ZUCHTDATA - VIENNA, AUSTRIA

Background

Changes in farm structures along with technological developments have a major impact on cattle breeding. Automatic milking systems (AMS), sensor-based herd management and automations in feeding are widespread and continue to increase strongly. In Austria, about 18% of cows on 1,403 farms under performance recording were milked with AMS in 2021, while in 2016 there were 539 farms. Among farms with more than 50 cows, almost 50% were milking with an AMS system in 2021. A survey conducted 2019 as part of the D4Dairy project showed that animal sensors, AMS and feeding systems are also used on smaller farms. Nine percent of farms with 30–40 cows used sensor technology, 18% of farms with 40–50 cows and 27%

of farms with 50–60 cows. Feeding robots were used on 5–7% of farms with 30 cows or more in 2019. Reasons for purchase of these systems were improved insights into farm performance (81%), reduced workload (76%), economic improvements (70%), and informed decision making (63%; Drillich et al., 2021). According to a survey by the World Holstein Organization (Landry, 2022), the percentage of farms with sensor systems (eartag, collar, bolus) ranges from 1%–70% in different countries. According to this survey these systems are used by 50% of farms in Germany and the Netherlands.

Currently, new digital options for animal care and optimization of environmental factors are emerging. Artificial intelligence combined for example with imaging sys-

tems for recording of BCS, weight, lameness, feed intake, etc., pressure sensors, microphones, thermal images for inflammation detection or inline analysis are continuously developed and introduced into the market. Features for improvement of animal health and welfare are already quite popular, whereas research and development focus very much on optimization of feed efficiency, methane and CO₂ measurement, deriving of resilience traits or determination of heat stress.

Data networking, APPs for recording and a wide variety of sensors (e.g., barn climate measurements) may better characterize the environment. More comprehensive information on climate, feeding, housing and management in combination with data

recording for breeding help to better characterize the influencing factors for example on the development of diseases and allow more accurate predictions of disease risks (Lasser et al. 2021).

Use of the new data for breeding purposes is essential

The need to make the best possible use of existing resources with the least possible environmental impact also requires appropriate phenotypes in breeding. For new traits, despite the possibilities in genomic selection with herd-genotyping, these are still the limiting factor for achieving genetic gain. Part of the data for new traits in breeding comes from external partners (e.g., veterinary diagnoses, hoof care, laboratory findings, etc.). New phenotypes for health, feed efficiency and environmental effects are often very expensive and difficult to collect. Auxiliary traits present a valuable alternative for these phenotypes. Estimators from Mid Infrared Spectra (MIR) for example show great potential for breeding for metabolism and energy balance. MIR equations for methane are currently being developed and explored.

Several works exist on the use of AMS data in breeding for linear scoring or udder health (Carlström et al. 2016; Poppe et al. 2019, Wethal et al. 2020). Carlström et al. (2016) found genetic correlations of 0.91–0.98 between teat coordinate traits and linear scoring traits. Poppe et al. (2019) found similar genetic correlations above 0.91 and heritabilities of 0.37–0.67 for udder exterior traits derived from AMS data.

Research on the use of data from new technologies for breeding is just at the beginning. One challenge is limited access to larger data sets due to missing technical infrastructure, data protection or conflicting interests. Furthermore, data may differ very much between manufacturers and information on the quality or comparability of data across systems is not available yet. Furthermore, plausibility checks and validations prior to any use of the data are necessary.

Heritabilities of sensor-derived activity, rumination behavior, etc. are consistently medium to high (14–40%; Byskov et al. 2017; Schodl et al. 2022). However, trait definitions are challenging. Alerts directly related to diseases are often not provided through interfaces because of proprietary algorithms. For breeding however, it is essential to derive traits that have a close genetic relationship with the target traits or other auxiliary traits, and which can also be derived repeatedly. There is a great need



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for research in this area. In the D4Dairy project research is currently being conducted on the trait complexes lameness and metabolic stability. Data from 5 different sensor systems are available. Questions of standardization, data validation and trait definitions for herd management and breeding are subject of investigation with a focus on added value from data pooling and BigData.

Digitalization and cattle breeding – important measures

For the future of cattle breeding, it is important to further develop the existing strengths and structures and to seize these new data sources for the development of breeding programs according to the societal requirements and for the sustainability of the whole cattle sector. The development of an extensive central cattle database over the last decades presents an excellent prerequisite for generating added value for the farmer by merging existing with new data streams. The high trust of the members in the “data processing by farmer owned organizations” (Grandl et al. 2021) is a very valuable. New technologies will be used increasingly on farms and may offer better support for farm management, which may increase competition with traditional performance recording. The basis of breeding are phenotypic data, which has until now been mainly generated from farms under performance recording and for some years in combination with farms under herd genotyping. Continuous data collection by the various, new technologies offer opportunities for breeding and should thus be used in an optimal manner. A good cooperation with farmers, technology companies and other external partners is essential for accessing new data for breeding.

The development of appropriate IT-structures for data storage and processing as well as the investment in research to derive meaningful traits and integrate them into breeding programs are crucial to the future of cattle breeding.

Acknowledgements

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The references list can be provided by the author if desired.



Dr. Christa Egger-Danner is Head of research/Innovation of the Rinderzucht Austria. Furthermore, Chairperson ICAR Functional Traits Working Group and Consortium Leader of D4Dairy (www.d4dairy.com).



AUSTRIAN AGRICULTURE AND CATTLE BREEDING

Opportunities and challenges

SC DI JOHANNES FANKHAUSER, FEDERAL MINISTRY AGRICULTURE,
FORESTRY, REGIONS AND WATER MANAGEMENT – VIENNA, AUSTRIA

The Austrian agriculture: A survey

Austria is marked by mountains and large-scale grassland areas. About 50% of the utilised agricultural area consist of grassland. Almost half of it are extensive areas, also the Alpine pastures in mountain areas, which are only managed in the summer period. The scope of grassland ranges from meadows mown once per year and rough meadows to intensive meadows with 6 cuts. The topography of the landscape determines the priorities of agricultural production.

Cattle farming is therefore the clear Number 1 of agricultural production establishments. Milk production contributes approximately 1.5 billion euros to the production value of agriculture, and

veal and beef production approximately 830 million euros. Cattle farming alone generates thus around 27% of the production value of Austrian agriculture.

The total population of cattle amounts to about 1.86 million cattle distributed among about 55,000 farms. On average only 34 cattle per farm are kept. Compared to the year before these results thus in a minus of 1.3% in terms of population and/or 2.4% in terms of farms. In the calendar year 2020 about 590,400 head of big cattle (-5.6%) were slaughtered.

In 2020 total of 3,384,412 t of cow's milk (+0.2%) was delivered by 25,872 (-3.9%) dairy farms to dairies and other purchasers. More than two thirds of the milk deliver-

ies originate from mountain farms. The dairy cow population, amounting to about 520,000 animals, has remained quite stable over the past few years. In addition to that there is a population of suckler cows of 190,000 animals, with a downward trend in the past few years.

Austria is, due to the large-scale grassland areas a traditional exporting country in the sectors of milk, beef, and breeding cattle. The degree of self-sufficiency with beef amounts to approximately 145%, with raw milk it amounts to 125%–130%, depending on the view regarding the quantity of milk fat and milk protein. As far as meat consumption is concerned beef and veal ranks, with a per capita consumption of around 12 kg, slightly behind poultry,



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and clearly behind pigmeat, which is, with a per capita consumption of 35 kg, the most popular kind of meat for Austrians.

Dairy farming is marked by cooperative structures; dairies are, for the most part, common property of dairy farmers. Over 50% of the milk produced in Austria is exported; the main buyer countries are Germany and Italy. In this context cheese is the most important export product. A particularity of the domestic milk production is the very high share of milk from organic farming (19.2%) and from so-called hey milk production (about one third of organic milk) – without silage.

The size of agricultural holdings must be described as small to very small in inter-

national comparison. Most of the farms are genuine family farms, without external workers. The average area amounts only to 24 ha. Most farms is run as a part-time farm. However, as a rule, there is a good level of mechanisation and technical equipment of the farms. This means that the production costs in Austria are high and consequently the path of quality and special production has been pursued for many years and has also been supported by agricultural policy by means of subsidisation programmes.

Cattle breeding and organisation

Livestock breeding is regulated in Austria by the animal breeding laws of the Federal Provinces and is organised and implemented by the breeding associations. The degree of organisation is very high, 83% of all dairy cows are subject to a milk performance test and almost 80% of all dairy cows are integrated in a breeding programme. Breeding and control associations for performance testing offer their services all over Austria, covering the whole territory. The regionally organised breeding associations are merged into breed working groups, which control the implementation of breeding programmes. Moreover, most cattle breeders are also members of the animal health service and produce according to the requirements of a national quality label.

The Austrian cattle breeding branch, but, first and foremost, the Fleckvieh breeding branch, profits from efficient structures, an outstanding integration of research, and an excellent cooperation with the Fleckvieh breeders in neighbouring countries. The representatives of cattle breeding are also the contact persons for politics concerning all questions of cattle breeding.

Fleckvieh is, with a share of 75%, before Holstein Friesian and Brown Swiss cattle by far the most important cattle breed in Austria. The dual use milk and meat has a great tradition in Austria and excellent future prospects. Among other things, the Austrian government has included the support of dual use in the government programme. The reasons for it are the positive effects of dual use from the point of view of the effect on the climate, but also the secured capacity for fattening of male calves.

Challenges and opportunities

Cattle farming constitutes a core element for the implementation of important goals of agricultural policy. This includes, the preservation of an agriculture covering the whole territory and the preservation of productive grassland areas, especially also in mountain areas. The decline in utilised

agricultural areas and the high level of consumption of areas for non-agricultural purposes give increasingly rise to concern.

The function of food security was underestimated for a long time in view of the seemingly unlimited offer of foodstuffs, but currently it is gaining increasingly attention again. In this context it will also be reasonable to take a more critical look at the so-far quite unlimited use of feedstuffs, which are also suitable for human nutrition, for all farm animals.

We will have to orient animal husbandry and cattle breeding even more according to the principles of sustainability. An intensive way of production is increasingly reaching its limits in several fields. The Green Deal of the European Commission has taken up these topics. Climate, soil and water protection, air pollution control, preservation of biodiversity and consideration of animal welfare have become in the meantime core elements of farm management, no cattle farmer can escape these topics anymore.

However, a type of cattle farming, which is oriented according to a high product quality, and also according to a high production quality, can meet these demands in all points. A type of cattle breeding, which is oriented according to a long usable life and a high life output, without extreme input of energy and concentrate, meets, to a high extent, the goal of sustainability. For this purpose, Fleckvieh has the best prerequisites in milk, as well as in meat production. Responsible breeding requires wise foresight, which international Fleckvieh breeding has proven so far. Jointly we will lead Fleckvieh cattle into a successful future. ☺



Johannes Fankhauser
is Director General – DG Agriculture and Rural Development, Federal Ministry Agriculture, Forestry, Regions and Water Management.



FLECKVIEH BREEDING IN AUSTRIA

Fit for the future

DR. CHRISTIAN FÜRST, ZUCHTDATA – VIENNA, AUSTRIA

For many decades, cattle breeding was almost exclusively about increasing production performance. However, this has not been the case for a long time – fitness and health have gained a lot of importance in recent years. How has the Fleckvieh breed, which dominates in Austria, developed in the trait groups of milk, beef, fitness and health?

Remarkable performance development

For a long time, the focus in Fleckvieh cattle breeding was on increasing milk yield while maintaining beef performance. The progress achieved in this regard due to significant improvements in management, but also through breeding measures, is remarkable. For example, the milk yield per year (305 days) of the Fleckvieh control cows could be increased by more than 3,000 kg to almost 8,000 kg since 1990.

The development of the average lifetime performance of the Fleckvieh cows that have left the farm is particularly impressive. The strong increase in milk yield per lactation in combination with the slight increase in productive life over the last two decades (currently 4.0 years) results in a massive, almost linear increase in lifetime milk yield. In the last 20 years, lifetime performance has increased by more than 10,000 kg, which is more than 500 kg per year. Since 1980, the lifetime yield has even more than doubled!

Modern genetic evaluation and progressive breeding objective

From the point of view of genetic evaluation, milk yield was predominant for many decades, also due to the lack of data for other traits. In 1963, a first form of milk breeding value estimation was introduced in Austria, in 1992 the first fitness trait in breeding value estimation was added with persistency (lactation curve). In the following years, numerous other fitness and health traits followed.

With the introduction of the total merit index (TMI) in 1998, fitness traits suddenly gained importance in breeding. Currently, the blocks milk, beef and fitness are weighted at a ratio of 38 : 18 : 44% in the TMI. Fitness includes the traits length of productive life, persistency, fertility index

FEI, calving ease, young stock survival, udder health index UdH and milking speed. Since 2013, the health traits have been integrated into the TMI via the FEI (early fertility disorders and ovarian cysts) and the UdH (mastitis). The conformation is indirectly included in the TMI via productive life and the UdH and is an important selection criterion.

Important for the development of the Austrian Fleckvieh cattle was and is the joint breeding value estimation with Germany, which has existed for more than 20 years. The genetic evaluation for Fleckvieh is currently carried out jointly with Germany and the Czech Republic; for individual traits, data from Hungary, Slovakia and Italy are also included.

Encouraging genetic improvements

Genetic trends, i.e. the average breeding values per birth year, are the means of choice for assessing longer-term developments in breeding. The figure shows the genetic trends of the female Fleckvieh cattle population for the total merit index (TMI), and the main trait groups milk index (MI), beef index (BI) and fitness index (FIT). Massive increases can be seen in both TMI and MI. The BI has recently increased slightly. In the case of the FIT, the long negative development could be turned around in a

positive direction. The main reasons for this are the introduction of breeding value estimates for the various fitness traits (e.g. 1995 productive life, 2010 health), the introduction of the TMI in 1998 with a strong weighting of the fitness traits and especially the introduction of genomic selection in 2011.

The new single-step evaluation (since 2021) will also make its contribution to positive genetic development in the future. This particularly applies to health traits, because single-step now for the first time provides genomic breeding values for mastitis, early fertility disorders and ovarian cysts not only for progeny-tested bulls, but also for genomic young bulls and females for selection. The decisive factor for the quality of the single-step breeding values is the largest possible proportion of genotyped animals that enter the genetic evaluation with phenotypic performances. Especially through the herd typing project FoKUHs, it has been possible that in the meantime almost 10% of the living female Fleckvieh cattle in Austria are already genotyped.

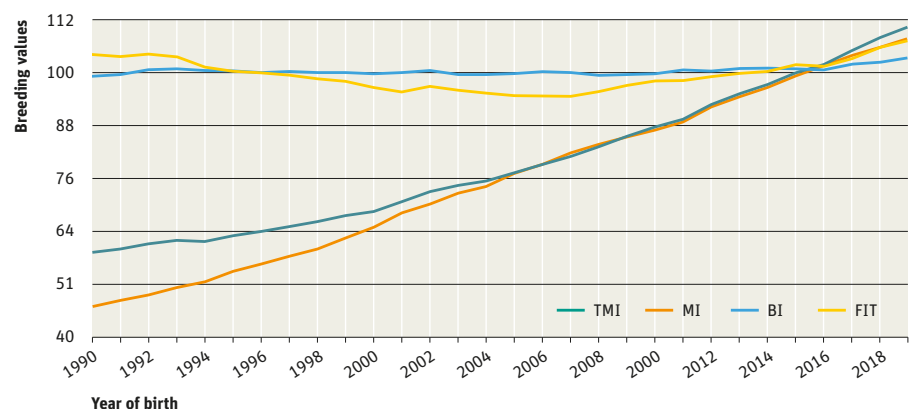
Difficult births more than halved

To take a concrete example of the pleasing development in the fitness traits, the noticeably positive genetic trend in the calving ease is also confirmed by the phenotypic data. The difficult birth rate, for example, has dropped significantly from 4.4% in 2005 to 1.7% in 2021. For first calvings, the heavy birth rate has decreased even more from 7.9% to 2.6%. This means that the difficult birth rates have more than halved. In addition to improvements in the husbandry system, the consideration of calving ease breeding values in the mating process plays an important role here. Especially since genomic breeding values are also available for young bulls, this effect is clearly noticeable and thus contributes significantly to animal welfare and profitability.

Further innovations in the field of health

Currently, work is being done on the development of a single-step breeding value estimation for claw health. In addition to the veterinary diagnoses, which have been available since 2006, a lot of data has been collected from hoof trimmers and also from farmers, e.g. within the framework of various projects such as Klauen-Q-Wohl, FoKUHs or D4Dairy. In total, data are available on about 20 different claw diseases. The claw health index, which will also be included in the TMI, is formed from these individual traits and the auxiliary traits culling reason claw and limb diseases and conformation traits.

Genetic trends for total merit index (TMI), milk index (MI), beef index (BI) and fitness index (FIT) of Austrian Fleckvieh cows.



Furthermore, work is being done on the expansion of the genetic evaluation in the metabolism area, where currently only breeding values for milk fever are provided. Apart from milk fever, metabolic traits include veterinary diagnoses of ketosis, acidosis and abomasal displacement and potential auxiliary traits.

Furthermore, within the framework of the cooperation with Germany, ongoing investigations focus on the development of a genetic evaluation for cow live weight as the basis for a breeding value of energy efficiency. Work is also to be done on reducing methane emissions through breeding.

Polled breeding is gaining in importance

Breeding genetically polled animals has also gained in importance in Austria in recent years. In Fleckvieh cattle, the proportion of polled inseminations has risen massively in recent years and is already over 26%, of which about 7% are with a purebred polled bull. This means that this year already about every 5th Fleckvieh calf is born phenotypically polled.

Conclusion

The milk yield of Fleckvieh cattle in Austria has continuously increased very strongly. Current analyses show that intensive breeding work has nevertheless succeeded in keeping the beef performance level, which is so important for a dual-purpose breed, stable. Beyond the production traits, fitness and health have moved from a secondary role to a central element in breeding decisions. The fitness and health traits are weighted higher in the breeding objective (total merit index) than the milk performance traits. As a result, the fitness and health traits have also shown a positive

development in recent years. Another important reason for the positive development is the consistent implementation of genomic selection. Current developments such as the single-step evaluation for claw health and metabolic stability, which are currently in preparation, will continue to drive the positive development if they are taken into account accordingly in the breeding objective. ☞



Dr. Christian Fürst

is part of the genetic evaluation team at ZuchtData EDV-Dienstleistungen GmbH, Vienna, and is responsible in particular for carrying out breeding value estimations for longevity, fertility, calving ease, rearing losses, health traits and the calculation of the total merit index as part of the joint German-Austrian-Czech genetic evaluation.

FUTURE FLECKVIEH

from traditional breeding to gene editing

PROF. DR. JOHANN SÖLKNER, UNIVERSITY OF NATURAL RESOURCES AND LIFE SCIENCES – VIENNA, AUSTRIA

First of all, I might be biased, being a Professor of Animal Breeding and Genetics, but also having grown up on a Fleckvieh breeder's farm. This combined history gives me the opportunity of having a very good view of how Fleckvieh changed over the last 50 years but also of predicting future changes based on scientific evidence in Austria and across the world.

First to history: The productivity of Fleckvieh, also called dual-purpose Simmental, has increased dramatically over the last 50 years. Taking annual reports of Rinderzucht Austria from 1970 and 2020, average 305-day lactation milk production has almost exactly doubled, from ~3,900 to ~7,850 kg, and so has lifetime milk yield, because length of productive life did not go down during that period. Many indicators of beef performance as well as fitness and health indicate stability and improvement over the last 30 years, the period for which such data are available. The reason for that are sophisticated genetic and genomic analysis procedures, balanced breeding objectives and carefully managed, yet very ambitious breeding programs. Implementation of genomic selection procedures early on has very substantially increased the accuracy of breeding values of young bulls and heifers, allowing broad use of young bulls in Artificial Insemination and a very sophisticated system of elite mating, including embryo transfer, allowing choice the best among full sibs from such matings.

So, what are the next steps to further improve a very well working system? Here, I am addressing 4 issues related to that, which are also in current public debate.

1. Big data and high throughput phenotyping have reached the cattle breeding domain! Automatic milking and feeding systems are being implemented in many farms. Austria, with its structure of relatively small farms has seen a dramatic change in farm sizes, with now many herds having 50-60 cows, well suited for a single AMS system. On-cow sensors tracking movement, heat, body temperature and rumination are also used in many farms. The current challenge, very well addressed by the Rinderzucht Austria led Comet project "D4Dairy", is how to make use of such data in breeding programs. I see a large range of opportunities there, but agreements need to be found with the companies producing AMS and sensors as well as with the farmers/breeders implementing such systems. Research is needed for how to accumulate machine readings into single numbers useful for breeding. Such indicators will then still need too much discussion, among researchers as well as with farmers and other stakeholders

2. Internationally, there are concerns of **methane emissions** of ruminant species contributing to climate change. After all, cattle contribute 35% of the total biomass of mammalian species on the globe (see Figure). My take is that measurement of individual methane emission of cows at a scale allowing inclusion of such a trait in a total merit index will not be possible any time soon. I am also not very optimistic about the use of correlated traits that are routinely measured on farm. Methane emission per unit output is clearly lower in intensive systems with high yielding animals compared to low input – low output systems. Improving

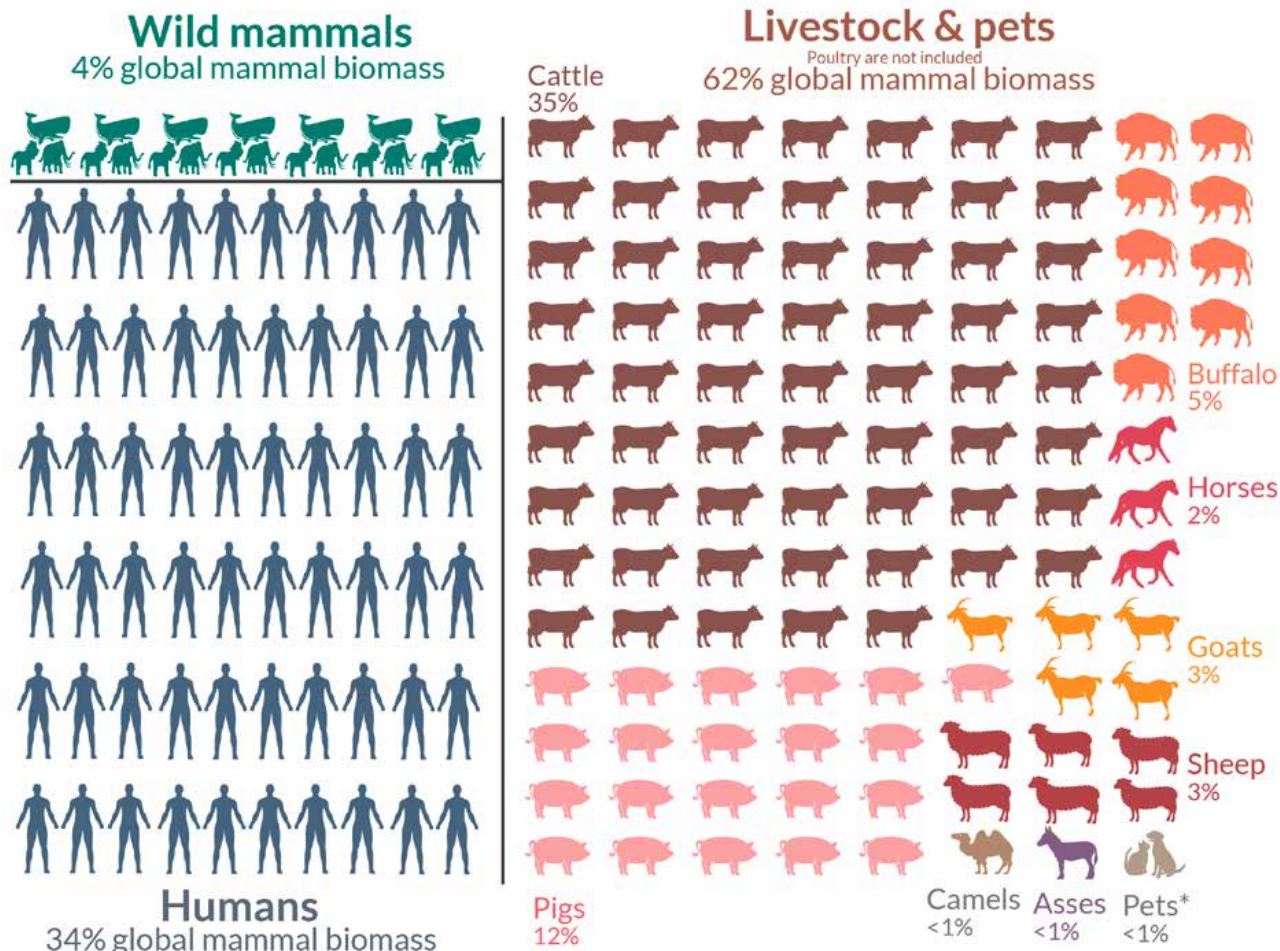
the management system, including pastures, as well as further enhancing the genetic capacity of Fleckvieh for the traits included in the current complex breeding system will improve the environmental footprint of Fleckvieh cattle

3. Gene editing, i.e. inclusion of genetic variants typically already existing in the species of interest by Biotech procedures is being put forward as a viable technology of genetic improvement, often called "New Breeding Technology" or "Precision Breeding". Crop breeding companies are at the forefront of this, NGOs representing organic farming, amongst others, are fighting against it with great ambition. Inducing random mutations by radiation is a standard tool of plant breeders; they do not understand why targeted mutation should not be considered just a much better way of creating useful genetic variation in a variety/breed. Animal breeders are not familiar with induced mutation, therefore they are more hesitant. To my mind, gene editing should be used if there is a big target that can be addressed with relative ease by gene editing. Genetically hornless (polled) cattle are such a potential target for me. If legally allowed, I would use that for Fleckvieh. An even more attractive target for Fleckvieh is the SLICK mutation, conferring heat tolerance to cattle. It is a natural mutation found in Senepol and Romosinuano (amongst others) cattle breeds of the Caribbean and Latin America. The corresponding gene edit is already functional and being tested with Angus cattle in Brazil and the U.S.A. Also, there is a Bill and Melinda Gates Foundation funded project "Precision crossbreeding of African dairy production systems",



Distribution of mammals on Earth

Mammal biomass is shown for the year 2015. or or = 1 million tonnes carbon (C)



*Bar-On et al. (2018) provide estimates of livestock only, without estimates of mammalian pets (e.g. cats and dogs). Pets have been added as an additional category based on calculations from estimates of the number of pets globally and average biomass. Data source: Bar-On et al. (2018). The biomass distribution on Earth. Images sourced from the Noun Project. OurWorldinData.org – Research and data to make progress against the world’s largest problems. Licensed under CC-BY by the author Hannah Ritchie.

Figure: Humans, livestock and pets contribute 96% of the total biomass (= body weight) of mammals around the world (ourworldindata.org)

where this edit is being used, amongst other disease-tolerance related mutations. I see great opportunities for Fleckvieh here, which brings me to the next issue:

4. Fleckvieh for developing countries. As many of you might know, I have been working in projects with African partners, in Africa, for many years already. The key driver was that no virtually successful breeding programs have been implemented there. We have implemented Community Based Breeding Programs (CBBP) for cattle and small ruminants in Ethiopia, Uganda and Burkina Faso. In Uganda, where crossbreeding of local cattle with Holstein Friesian and Jersey has been common practice for almost 30 years now, farmers and officials are very keen on replacing the dairy crosses with dual-purpose crosses. What an opportunity for Fleckvieh!

To summarize, the Fleckvieh breed has improved enormously over the recent decades, for example overtaking Brown Swiss in milk production in Austria and having the highest lifetime milk production of all breeds. Very high engagement and sophistication of breeders and breed managers are the keywords here. Given this drive, Fleckvieh breeders will manage future challenges with ease and will find best ways of how to make best use of new technologies. Given that many African countries are changing their stance away for dairy to dual purpose crossbreeding, there are great opportunities for the Fleckvieh community. Collaboration will pave many pathways. Good luck, Fleckvieh! 🍀



Prof. Dr. Johann (Hans) Sölkner
Full Professor of Animal Breeding and Population Genetics, University of Natural Resources and Life Sciences (BOKU), Vienna. Has close links to the Fleckvieh community, involved in establishing breeding value estimation, genomic selection and the national Fleckvieh breeding program. Also working internationally, with collaborations in South America, Russia and several countries of Africa



MODERN FLECKVIEH BREEDING

What changes are required for breeding programs?

PROF. DR. KAY-UWE GÖTZ, BAVARIAN STATE RESEARCH CENTER FOR AGRICULTURE (LFL BAYERN) – POING, GERMANY

Background

The dual-purpose strain of Fleckvieh took a very important step with respect to international competitiveness by unifying the genetic evaluations of Germany and Austria in the year 2000. Today, also Czech Republic, Slovakia, Hungary, and Italy take part in the joint evaluation system. The large population with comparable breeding values allows a selection of young sires and bull-dams across countries. As a result, Fleckvieh succeeded in maintaining competitive selection responses which results in a constant distance in milk yield as compared to Holstein and a constant proportion of the Fleckvieh breed. More and more, farmers and politicians appreciate

the dual-purpose concept which allows for the most efficient production of beef and dairy under Central European conditions.

Traits

Breeding programs always must adopt new developments and move forward. Typical for today's breeding work is that we frequently have to deal with traits that are either difficult or expensive to measure. Health and claw trimming data are basically not very difficult to record, but their use for genetic evaluation requires consistent recording over longer periods which is often difficult for practitioners. In general, today's farmers are much more involved in data collection than in former times.

For certain traits we still do not have a perspective for a widespread recording. Feed efficiency, for example, is an economically and ecologically important trait. However, its recording requires expensive equipment and the recording of additional data like feed composition. Methane emission shows genetic variation, but we also know that two efficient ways of reducing them, namely increasing milk yield, and increasing concentrates, are not appreciated by the society.

Performance testing

Traditional breeding programs were designed around the necessity to produce enough daughters from unproven bulls for genetic evaluation. Since young bulls

were barely accepted very large populations under milk recording were required to produce enough daughters for a large number of young bulls. Today, the Fleckvieh populations are using between 65 and 82% of genomically proven young bulls and it is far less important to have many daughters of a bull at an early age. This provides new opportunities for the organization of milk recording or performance testing in general.

The Fleckvieh populations are currently transforming cow genotyping initiatives from research projects into permanent data collection schemes. We have learned for all traits that data recording must be pursued continuously to enable reliable genomic evaluations, especially for low heritability traits like health traits and claw trimming data. This causes considerable costs for herdbook and AI-organizations which are increasingly difficult to finance as animal numbers are declining. But there are also other threats to milk recording. On one side of the spectrum farms with older housing systems give up dairy production and on the other side, larger farms with automatic milking systems no longer feel the need to participate in milk recording schemes.

That means that we must redesign data collection in dairy breeding programs. E.g., the Bavarian program “FleQS” and similar activities in our partner populations strive to cover 20% of the cow population with genotyping and extended performance recording by 2025. At present that means 120 000 cows in Bavaria which are obliged to use at least 40% of the most recent young bulls. This system would produce at least 24 000 females per year of which more than 17 000 will have performance recordings. As a result, young sires would have approximately 55 daughters which is perfectly adequate to provide enough information for the genomic evaluation system. These data could be supplemented by data for yield and health traits from herds with automatic milking systems which could in return receive discounted genotyping.

Organizations

Herdbook organizations, AI-organizations and animal recording companies must cooperate much closer in the future. In countries or regions where the Holstein breed dominates, we can already observe that all parts of a breeding program are united in a single organization. This is logical, because the costs of modern breeding programs cannot objectively be allocated to different organizations. Within a single organization it is far easier to decide on ac-



tivities and innovative designs than among three or more different organizations.

With more powerful organizations we will also have better conditions to develop new concepts that are necessary to tackle new traits. The Fleckvieh community has less opportunities to pool data on expensive traits from many countries, because it is much smaller than Holstein. We must develop proxies for these traits based on experimental data from research stations in Germany and Austria. Hopefully, these will be complemented by field data collected with GreenFeeders which will enable us to select for reduced methane emissions. But this will also induce an even greater involvement of farmers in data recording.

External Competitors

The Fleckvieh community lacks a strategy to protect its best genetics against competitors from outside. All herdbook organizations are still marketing their best genetics via auctions which gives commercial competitors the opportunity to buy the best genetics without investing in the breeding program. Even if a commercial competitor would be willing to invest in the breeding program, he would reduce the market share of those organizations that built up the successful system. European animal breeding legislation gives little opportunity to prevent competitors from entering the market. The best strategy would be to control the marketing of elite genetics and to strengthen the own breeding program as much as possible.

Summary

There is a growing discussion about a reduction of the consumption of animal products

to reduce the number of animals and their emissions. If this would become true, all breeding programs would decrease in size, which would reduce genetic progress, revenues and therefore, the competitiveness of the Fleckvieh breed. There is only one answer to this challenge: All Fleckvieh organizations must stand together and cooperate as closely as possible. Fleckvieh is the only dairy breed in the world that has an international genomic evaluation using a single step model for all traits and all subpopulations are closely linked by 20 years of joint evaluation and selection. From the point of view of genetics there are no obstacles to set up one powerful transnational breeding organization. ☺



Prof. Dr. Kay-Uwe Götz

is director of the Institute of Animal Breeding at the Bavarian State Research Center for Agriculture. He has been head of the genetic evaluation team of Germany and Austria since the year 2000. Apart from genetic evaluation he is working on future perspectives of livestock.

DUAL-PURPOSE CATTLE BREEDS

as a success factor for sustainable dairy and beef production

DR. STEFAN HÖRTENHUBER, UNIVERSITY OF NATURAL RESOURCES
AND APPLIED LIFE SCIENCES – VIENNA, AUSTRIA



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Cattle farming has to navigate between different requirements for a sustainable production. Due to its efficient and combined production of milk and meat, the dual-purpose breed Simmental has advantages compared to specialized breeds in terms of environmental and climate protection, ecosystem services, economic efficiency, and food security.

General advantages of dual-purpose cattle

The domestication of ruminants and cattle in particular was an important achievement on the way from hunter-gatherer societies to settled agricultural communities. Like the first cattle, Simmental cattle are and were appreciated for their suitability for triple or dual use (as draught animals, for milk production and for fattening). With the evolving possibilities of milk processing, many breeds specialized for milk production. However, Simmental cattle continued to be dual-purpose cattle with a corresponding fattening capacity, producing milk and meat in an efficient way.

Simmental cattle have lower annual milk yields per cow than, for example, German Holstein (almost -1,200 kg). However, the

economic and environmental disadvantages of lower milk yields are compensated for (Spiekers et al., 2022): firstly, by a significantly higher meat yield of the culled cows and calves, especially the male offspring (e.g. 120 grammes higher average daily weight gain of Simmental cattle compared to Brown cattle); the feed expenditure of Simmental cattle was thus – in relation to the masses of carcass – on average about 8% lower than that of Brown (Swiss) cattle in three trials conducted by the LfL Bavaria. Secondly, lower energy deficits at the beginning of lactation are associated with a lower susceptibility for a disease. Consequently, an evaluation of the top German DLG dairy farms showed that the profits per kg of energy-corrected from 2005 to 2020 milk were almost 4 cents higher for Simmental than for Holstein cattle (Spiekers et al., 2022).

The lower specialization for milk results in a higher robustness of the Simmental cattle and a higher resilience of the entire dairy and beef production systems to disturbances (Fruggens et al., 2017, in Spiekers et al., 2022). Due to the shorter calving interval compared to e.g. German Holstein, Simmental is particularly suitable for pasture-based husbandry with seasonal calving (Steinberger et al., 2012).

Greenhouse gas emissions and food competition (use of concentrate feed)

Ruminants are criticized for causing high greenhouse gas emissions. Globally, 35% of methane emissions come from livestock, the majority from cattle (UNEP, 2021). Livestock accounts for at least 16.5% of global greenhouse gas emissions (CO₂ equivalents, GWP-100) according to Twine (2021). Different production systems cause very different emissions per kg of milk and meat or per ha of farmed land. The analysis of greenhouse gas emissions for a given amount of milk and beef shows the advantage of dual use: Simmental cattle cause lower emissions than the combination of milk production with Holstein Friesian and the supplementation of missing amounts of meat with specialized suckler cattle (Zehetmeier et al., 2012).

Due to the lower milk yield, Simmental cattle require less concentrates than dairy breeds (Spiekers et al., 2022). This was also shown in an Austrian study data with an 8% lower amount of concentrate per kg milk (Egger-Danner et al., 2017; “Efficient Cow” project). Simmental cows’ food competition was thus lower than that of other breeds analyzed in the “Efficient Cow” project, i.e. Brown Swiss and Holstein Friesian. The conversion efficiency of food-grade feed protein into protein in milk and beef (see Ertl et al., 2015) was thus on average almost a quarter higher in Simmental cows.

Especially in times of the Ukraine war with reduced grain and grain legume harvests and less export amounts and the consequences for global food security, the importance of ruminants with their ability to convert grass into valuable food can be seen. The United Nations Climate Impact Report (IPCC, 2022) shows that the risk of climate-related crop failure will continue to increase dramatically worldwide in the coming decades. Future animal husbandry and our consumption will have to adapt to the consequences of the climate crisis.

Biodiversity and ecosystem services

With regard to biodiversity, on the one hand the preservation of genetic diversity of cattle is relevant: Worldwide, locally adapted cattle breeds have been and are being lost as a result of “Holsteinisation”. In comparison with, for example, Holstein and Jersey, Simmental cattle show significantly low inbreeding coefficients (Senczuk et al., 2020). On the other hand, in order to achieve a high level of biodiversity on the land used for livestock farming, it is important not to aim for high intensities in terms of (milk) yields or energy and nutrient density requirements of the feed. This allows a high proportion of permanent grassland in the cattle diets. As described above, Simmental cattle have a higher proportion of forage in their rations. Especially in the region of the Alps, many areas are considered “biodiversity areas” (high nature values farmland). These are e.g. hay meadows, alpine pastures, extensive meadows cut one or two times and areas with landscape elements. Even intensively used meadows can maintain or increase biodiversity by staggered mowing and site-adapted use. In addition to extensively used permanent grassland, extensively managed or fallow arable land also contributes to high biodiversity. One of the most important functions of intact biodiversity for agriculture is pollination by insects, e.g. wild bees. Studies show that yields of many fruit, vegetable and arable crops, such as soybean, field bean or rapeseed, decline when pollinators are no longer sufficiently present (Klein et al., 2007; Palmer et al., 2009).

The conservation and promotion of biodiversity is a basis for many important ecosystem services. Besides the production of food (milk, meat) or other goods (e.g. leather), cattle farming provides other ecosystem services such as purified drinking water, which is provided in high quality especially under permanent grassland (Eder et al., 2015). Adapted land management with permanent soil cover (permanent grassland!) prevents erosion (Zessner et al., 2016). The management of permanent grassland in alpine regions reduces the risk of avalanches (Tasser et al., 2003). A high humus content can better store water in the soil and thus prevent surface runoff, while also storing carbon in the soil. This carbon storage is significantly greater under permanent grassland than in arable land. Legumes in grassland and as forage or grain legumes on arable land also accumulate humus carbon and add biologically fixed nitrogen to soils, which can reduce emission-intensive commercial fertilizers. Permanent grassland soils in the temperate zone in Europe con-

tain as much carbon as forests in biomass and soils in the average of one growing season, according to data in Houghton and Hackler (2001). So-called cultural ecosystem services include landscape and recreational value in a landscape influenced by agriculture. Livestock farming, in particular cattle farming, helps to maintain jobs and infrastructure in rural areas, also in combination with tourism. Permanent grassland and cattle farming based on grassland have an important function with regard to all these ecosystem services and provide a guarantee for sustainability. Traditionally, dual-purpose breeds, such as the dominant Simmental in Austria, play a special role.

Conclusions

The goal of sustainable cattle farming is the optimal use of roughage from (permanent) grasslands while at the same time taking into account low emissions and high ecosystem services. Simmental cattle, along with other dual-purpose breeds, have already shown advantages in this respect. In view of current and future crises such as the Ukraine war and climate change, breeding objectives, animal husbandry and feeding should be adapted accordingly (e.g. animals of lower body mass that make efficient use of roughage and have low concentrate requirements), whereby Simmental may play an even greater role in the future. 🌱

The references list can be provided by the author if desired.



Dr. Stefan Hörtenhuber

is assistant at the University of Natural Resources and Life Sciences, Vienna (BOKU) and a senior researcher at the Research Institute of Organic Agriculture FiBL in Vienna. Diploma and doctoral studies at BOKU. His main areas of work are the modelling of material flows of agricultural production systems and analyses of sustainability aspects, e.g. life cycle assessments.



INTERNATIONAL DEVELOPMENTS **in the breeding of Simmental cattle for beef**

BRUCE HOLMQUIST, CANADIAN SIMMENTAL ASSOCIATION – CALGARY, CANADA



The history of genetic improvement of beef cattle in North America traces back to the introduction of Spanish Longhorn cattle to the continent in the late 1400s. Cattle are not indigenous to North America and until then only bison roamed the region, so cattle were non-existent. Longhorn cattle were released into the wild and over a period of time, mother-nature adapted them to the new environment through a process of natural genetic selection that took place over several centuries. A hardy animal evolved that was adaptable to the southern regions of the continental USA.

In the late 1800s traditional British breeds of cattle were imported. Shorthorn, Hereford and Aberdeen Angus cattle were used with the purpose of genetically improving the Longhorn cattle through the process of crossbreeding and the North American beef industry was changed forever.

As the North American beef herd became more heavily influenced by British based beef breeds, it became clear that some changes were drastically needed to not only widen the genetic base, but also to add growth and performance into some breeds that were displaying undesirable traits such as dwarfism. In the late 1960's there was a strong importation of European beef breeds that changed the overall size and performance of the beef production system, and eventually overall cow size. Performance testing and data collection heavily influenced the decision-making process of genetic improvement in North America. "Record of Performance" programs were developed with Government and University support. Maximum performance was the new goal for some producers however it was often at the detriment of other economically relevant traits.

Genetic evaluations were developed by several American Universities in collaboration with individual breed associations as they sought to provide the tools to assist seed-stock producers to produce a better and more profitable animal for their commercial customers. Next to follow was the evolution to multi-country joint genetic evaluations such as the Canada/US North American Simmental evaluation. Contemporary group structures which were already being used allowed the opportunity to eliminate any significant environmental and management differences which greatly added to the accuracy of common use genetics.

The next step in genetic evaluations that provided a significant improvement was the multi-breed concept which led to the establishment of International Genetic Solutions (IGS). Through the initial design and development initiated by the American Simmental Association, a multi-breed, multi-country joint evaluation has evolved that utilizes a database with over 20 million animals encompassing over 20 partners from several countries around the world. This provides producers in those breeds access to EPDs that are updated weekly allowing them the most current genomically enhanced EPDs possible.

The rapidly increasing use of beef sires on dairy herds throughout North America is a new opportunity that exists for data collection on beef traits in a new crossbreeding structure.

This presentation will provide more detail and information on ongoing development of production improvements of beef cattle through the power of the Simmental breed. 📍

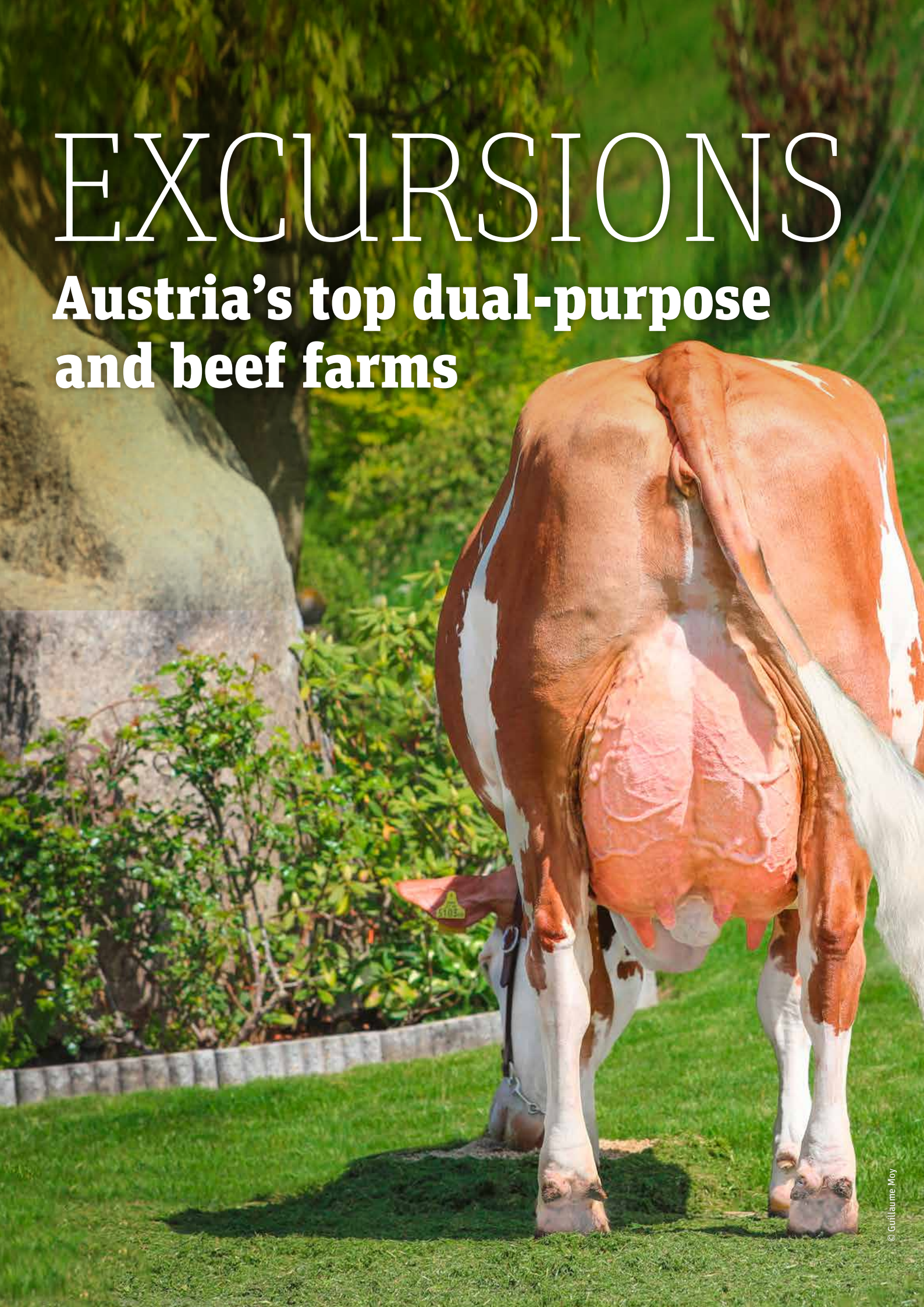


Bruce Holmquist

is the General Manager of the Canadian Simmental Association and Past President of the World Simmental Fleckvieh Federation. He is a WSFF (World Simmental-Fleckvieh Federation) Golden Book Award recipient and a member of the Canadian Simmental Association Hall Fame. Bruce and his family have also raised Simmental cattle since 1976.

EXCURSIONS

**Austria's top dual-purpose
and beef farms**





© Jan Skuk – LFS Pyhra

Modern and well-adapted breeding strategies and methods ensure the success and the consistently high performance of the farm's herd

CATTLE BREEDING AND MILK PRODUCTION – A LONGSTANDING TRADITION WITH A PROMISING FUTURE

Dual-purpose Fleckvieh Farm – Fachschule Pyhra (Pyhra Technical College), Pyhra, Lower Austria

ING. THOMAS ZUBER, LFS PYHRA – PYHRA, AUSTRIA

Thanks to its dedicated team of teachers and staff, the training and experimental farm of the Pyhra Agricultural College in the heart of Lower Austria has evolved into a model operation for cattle breeding in the state. The farm's herd comprises about 60 dairy cows, their offspring and around 30 bulls for fattening. The Pyhra Educational Centre mainly focuses on training students and farmers from Austria and abroad, as well as on developing new knowledge in the field of cattle breeding and dairy farming, based on the motto, "learning by doing".

Breeding success with an eye to the future

This farm has been designed with modern and changing breeding objectives in mind, and the possibilities of embryo transfer were successfully exploited at an early stage. The cow Edelweiss (Max x Hetro) represents the starting point for one of the farm's two dominant E bloodlines. This bloodline has had a significant impact on the farm's female offspring, about 40% of whom currently descend from it, which explains their capacity and calibre. The animals are characterised by reliably high lactation performance with very good components.



Last year, the cow Ruth (Dones x Haxolt) reached this milestone with a lifetime yield of 105,546 kg



The cubicles are equipped with straw/manure bedding

As the farm participates in the FoKUHs project, genomic data are available for all females, which are bred to 100% genomic sires.

The farm's best-known Fleckvieh sire is probably WICHTL (Waxin x Didi). Through WICHTL, the Pyhra training farm's excellent E cow bloodline has already exerted an influence on Fleckvieh breeding. His dam is ELKE, a daughter of DIDI and descendant of HAXALA and STREITL with a lifetime milk yield of 100,000 litres. In particular, WICHTL stands out for the feet & leg and udder quality of his daughters after three lactations.

Longevity – the key to productivity

Longevity and productivity can either be expressed in terms of lifetime yield or, in a more modern way, in terms of lifetime daily yield. However, all breeders agree on one thing: a lifetime yield of 100,000 litres is an impressive indicator of longevity.

At the affiliated dairy, around 80,000 kg of milk are processed into products such as semi-hard cheese, Camembert, curd cheese and fruit yoghurt. The adjacent farm shop closes the circle by bringing the products to consumers.

Learning by doing

One of the hallmarks of agricultural colleges is their strong emphasis on practical application across all areas of agriculture and forestry. More than 1,600 crop test plots – many of them dedicated to grassland and forage production – provide answers to challenges related to feed. One of the farm's current projects deals with the cultivation of catch crops for use as animal feed. Proper management and utmost care in dairy farming are the main challenges when it comes to the training of young people and the continuous education of adults.

“Modern and well-adapted breeding strategies and methods ensure the success and the consistently high performance of the herd.”

In 2020, the Pyhra farm took training in cattle husbandry to a new level with the construction of a modern, animal-friendly training and experimental barn. The first animals moved into the new barn after a construction period of about one year.

The well-being of humans and animals was a top priority already during the planning phase. The result is a well-lit building with

plenty of air and comfortable lying areas. The barn successfully combines a variety of housing options, floor materials and two different types of milking systems under one roof.

The section reserved for the 60 dairy cows features paved floors (some with rubber pads) and deep stalls with flexible dividers. The cubicles are equipped with straw/manure bedding. Fresh straw is added twice a week. The dairy cows are fed full TMR, consisting of grass silage, maize silage, straw, cereal meal, protein supplement, urea and mineral mixture

For feeding, the cows stand on a 160 cm long raised platform, which allows them to feed in peace and quiet. The rations are mixed and distributed by an automatic feeding system. This system offers enormous advantages in terms of flexibility, as small groups of animals can be specifically cared for. At present, seven different rations are mixed. The benefits are especially apparent in the targeted feeding of dry cows, which are fed in one phase. Problems in the run-up to calving (recumbency, postpartum behaviour, etc.) have become extremely rare. The generously proportioned straw area, which the cows enter about three weeks before calving, also plays a major role in getting the lactation off to a good start.

Milking takes place via a “combination” milking parlour. This somewhat unconventional mechanism consists of a six-stall herringbone milking parlour with quick exit and a side-by-side milking parlour with eight places. The milking facility provides a pleasant, well-lit working environment for both humans and animals.

Exploiting the full strength of Fleckvieh

For the farm, it is of major importance to showcase and commercially exploit the dual-purpose nature of Fleckvieh cattle. This quality can be impressively demonstrated to farmers and cattle breeding customers from Austria and abroad in the highly animal-friendly fattening section, which features pens with two sections and a littered lying area. The performance of the animals is excellent, with daily weight gains of around 1,450 g.

“The well-being of the youngest animals must be ensured”

This is the farm’s motto when it comes to calf rearing. Providing plenty of space to minimise ammonia exposure is only one pillar of the system. After receiving colostrum, the calves continue to be



Learning by doing is an important principle of teaching in competence-based learning. At the high-performance dairy barn of the Pyhra Educational Centre, students acquire hands-on experience in small groups

supplied with iron and selenium. The intensive feeding regime during the first four weeks leads to high weight gains and the proper development of the immune system. After a whole-milk feeding phase of 10 to 12 weeks, the calves are weaned and reared on hay-based mixed ration. During the milk phase, the calves are fed TMR starting at two weeks of age. This intensive feeding system is also followed for heifers, so that the first insemination is possible at 15 months.

Developing new knowledge and putting it into practice is the main aim of the training and experimental stables at the Pyhra Educational Centre. 🌱

Farm data

Name	Bildungszentrum Pyhra (Pyhra Educational Centre)					
Location	Landwirtschaftliche Fachschule Pyhra (Pyhra Agricultural College), Kyrnbergstrasse 4, A-3143 Pyhra					
Altitude	300–400 m					
Precipitation	850 mm					
Farm size	Total area: approximately 160 ha, divided into 40.10 ha of arable land (32.10 ha of grassland and 1.40 ha of orchards), 73.2 ha of forest and 11.2 ha of built-up area, parkland, paths, etc.					
Livestock	60 dairy cows plus their offspring and around 30 bulls for fattening					
Feed	TMR via an automatic feeding system 60% maize silage, 40% grass silage, cereals cultivated on site					
Type of husbandry	Free-stall barn with paved floors (partly with rubber coating) and deep stalls with flexible dividing bars					
Milking parlour	Combination of two types (herringbone and side-by-side)					
Performance over time	Years	Cows	M-kg	F%	P%	F+P-kg
	2019	37.6	9,835	4.07	3.60	755
	2020	41.9	10,216	4.03	3.55	774
	2021	53.9	9,277	4.17	3.56	717
Functional data	Calving interval 385 days					
	Insemination rate 2.1					
	Cell count 140					
	Longevity 2.9 years					
	Age at first pregnancy 15 months					

A PARTNERSHIP THAT MAKES SENSE

Dual-purpose Fleckvieh Farm – Perschlingtal Milch GesnbR, Pyhra, Lower Austria

STEFAN MITTERBÖCK, NÖ GENETIK – BERGLAND, AUSTRIA



In 2017, a new cowshed for 200 dairy cows with 4 Lely milking robots was put into operation

In 1998, three farmers from Pyhra (Lower Austria) founded Perschlingtal Milch GesmbH. At that time, the three farms together had just over 50 dairy cows. They began by building a shared barn with a 16-cow rotary milking parlour for 130 cows, a project that was unique and exemplary in the region at the time. As early as 2003, they expanded the barn by 150 cubicles, mostly for young cattle. Proof of the success of the partnership was the construction of another new building in 2017. This new facility, a deep-litter cubicle barn for 200 cows, is equipped with four milking robots and a spacious calving area.

Two different systems – without any drawbacks

The somewhat unusual combination of a manual (rotary parlour) and an automatic (robot-based) milking system also has its advantages. For example, all heifers are accustomed to the milking process in the rotary parlour during the first weeks after calving. This has the added benefit that the animals can be visually checked twice a day during milking to ensure that they are in good health. Depending on the available space and the animals' fitness, the cows then proceed to the milking robot. If a cow cannot be milked by the robot or if her udder is not suitable, she won't be sent to slaughter, as is often the case, but will be returned to the conventional system for manual milking.

When collaboration makes sense

A lower workload and greater flexibility are the most important arguments in favour of this type of partnership. Which other dairy farmer can afford to have every second or third weekend off? The three partners are able to enjoy their holidays with a clear conscience, as no external labour is required. From an economic point of view, the partnership also offers certain benefits that should not be underestimated.



From left to right: the partners Stefan Moser, Josef Spindelhofer and Leopold Fischer



Barn facility for 365 dairy cows



Cowshed with a cubicle barn and a 4,700 m³ slurry cellar

One of them is being able to cope with the most labour-intensive periods, for example during harvesting. The reduction in the number of working hours per litre of milk is also an important economic factor.

Breeding and marketing

As Perschlingtal Milch GesnBR participates in the FoKUHs project, all female animals are genotyped. The calves are then pre-selected based on their genomic breeding value and their dam's conformation. About two thirds of them are destined for the participating farms while the rest are sold. At a weight of between 110 kg and 120 kg, all male calves are sold to a fattening farm.

In the case of insemination bulls, special attention is paid to the breeding values for feet & legs and udders. According to the three farmers, these are the most important characteristics in terms of functionality, udder health and longevity. Only 100 per cent genomic sires are used for insemination.

A pure Fleckvieh herd

For the three farmers, the reasons for relying on the dual-purpose Fleckvieh breed are obvious. In addition to the ample milk yield, with a long-term average of more than 10,500 kg per cow, beef is becoming an increasingly important factor, given that the revenue from slaughtered cattle has developed very favourably as of late. Thanks to their genetics, Fleckvieh cattle are robust and in good condition, which also helps to mitigate the effects of minor errors in management. Healthy udders of good quality are just as important for the farmers.

With 365 cows and a milk yield of over 9,500 kg per cow, the partnership is currently one of the leading milk producers in Austria.

The farmers behind Perschlingtal Milch GesnBR have taken an unusual path, but their success has definitely proved them right. 🌱



The bull GS EMINENT (S: ETOSCHA) was bred by the partnership

Farm data

Owners	Partnership between three farmers – Leopold Fischer, Stefan Moser and Josef Spindelhofer
Location	Betriebsgemeinschaft Perschlingtal Milch Ges.n.B.R, Unterloitzenberg 3, A-3143 Pyhra
Altitude	300 m
Precipitation	800–900 mm
Farm size	50 ha of their own farmland and 83 ha of leased farmland (133 ha in total)
Livestock	Currently 365 dairy cows, 250 offspring (130 of them at a partner farm) and 30 male calves (for sale to a fattening farm at a weight of 110 kg to 120 kg)
Feed	TMR via a self-propelled feed mixer; 3 groups (cows being milked, dry cows, transit group). TMR consists of 50% maize and grass silage each, 6-7 kg brewer's grains, molasses, protein concentrate, cereal mixture and minerals
Type of husbandry	Deep litter boxes filled with separated slurry (since 2015)
Milking parlour	4 A4 Lely milking robots + 16-unit rotary milking parlour
Memberships	Breeding association and LKV since being founded in 1998

Performance over time	Years	Cows	M-kg	F%	P%	F+P-kg
	2018/19	352.7	10,581	3.93	3.54	791
	2019/20	348.6	10,450	4.03	3.56	793
	2020/21	360.9	10,238	4.04	3.51	773

Functional data	Age at first calving 26.3 months
	Calving interval 384 days
	Performance at first lactation 8,984 kg of milk
	Insemination rate 1.8
	Ø TMI of the herd 111
	Ø final performance 30,527 kg of milk
	Ø TMI of the calves' sires 129



Feeding is based on TMR, delivered by a self-propelled feed mixer



© Guillaume Moy

LEISTE Pp (sire: Herzpochen), TMI 131, MI 121; two sons of EASY – AT 64 5294 574, genetically polled (TMI 136), and AT 64 5298 974 (TMI 140) – have been purchased by the insemination station

POLLED CATTLE – a rocky road *Dual-purpose Fleckvieh Farm – Steiner family, Neusiedl bei Hernstein, Lower Austria*

STEFAN MITTERBÖCK, NÖ GENETIK – BERGLAND, AUSTRIA

The Milchhof Steiner dairy farm in Neusiedl bei Hernstein is considered one of the pioneers in polled breeding in Lower Austria. Located about 40 km from Vienna, in the beautiful Triesting Valley, the farm is run by the brothers Martin and Hannes and is characterised by the small size of its fields (1 ha on average).

Their grandparents Helene and Adolf Steiner joined the LKV and the breeders' association very early on, already in 1968. In 1971, the family took the first big step towards the future by building a new barn for 24 cows, as the old cowshed, with room for 8 cows, had become obsolete. In 2001, they completed a free-stall barn with 138 berths for dairy cows on deep pens and slats. In the process, the parents Anna and Adolf founded a partnership (a so-called "GesnbR") with their sons Martin and Hannes under the name "Milchhof Steiner" (Steiner Dairy Farm), which was followed by continuous renovations and the construction of new buildings. In 2013, for example, they added a barn for female calves on high pens with 44 berths, and in 2020 they converted a shed for 50 calves to deep litter with an automatic feeder.

In 2021, the 2x8 side-by-side milking parlour was replaced by three milking robots, which are currently used to milk around 140 dairy cows.

Strength through family ties

The brothers Martin and Hannes run the business together, actively supported by their wives, parents and now also their children. In a nutshell: two families with a common goal. This type of partnership brings with it several advantages that one family alone would normally not be able to realise in the same way. For example, the farm's vehicles can be optimally used, as several workers are always at hand, and each family member has his or her own strengths that they can contribute in an optimal way.

This also provides certain temporal resources, enabling the families to go on holiday without having to think about the stables, or to take enough time off to recover in case of illness.

It is only thanks to the farm's cohesion that the brothers are also able to act as public advocates for the profession. Martin has been chairman of the Lower Austria Milk Cooperative (Milchgenossenschaft Niederösterreich – MGN) since 2021, while Hannes acts as chairman of the Pottenstein Cattle Breeders' Association and deputy chairman of the NÖ Genetik Cattle Breeders' Association. In order to reconcile all these activities with the day-to-day work on the farm, a constant and effective exchange of information is required.

Pioneers of polled genetics in Lower Austria

The Milchhof Steiner was one of the first farms in Lower Austria to make wider use of genetically polled insemination bulls. This was not principally based on breeding considerations, but on the dehorning of the calves. "This is simply an unnecessary and unpleasant intervention for humans and animals alike", says Hannes Steiner.

A rocky road to success

In the beginning, the Steiners mainly focused on the polled gene when it came to the selection of insemination bulls and the sale of heifers for auction in Bergland. At that time, however, polled breeding was still more or less in its infancy. Besides the rather narrow selection on offer, the quality of the available polled animals could not yet be compared to that of horned insemination bulls.

As a result, the farm's dairy herd suffered a not inconsiderable setback, with a significant drop in udder quality, milk yield and milking speed. The initial sense of euphoria and the success on the male side could not conceal these losses. Even some embryo transfers did not produce the desired results.

Following these negative developments in the herd, the Steiners began to rethink their approach. Nowadays, they do not compromise on quality when it comes to selecting polled bulls for insemination, especially as regards conformation. The same goes for the more than 20 heifers sold each year, meaning there is no longer a "polled" bonus.

Belated success with LEISTE Pp and others

It was only the genotyping of the herd, which is obligatory for all farms participating in the FoKUHs project, that brought a breath of fresh air into the Steiners' stables. Two animals have stood out in particular: LEISTE Pp, a daughter of HERZPOCHEN with a total breeding value (TMI) of currently 131 points and SYLVI Pp (sire: Rimmel) with a TMI of 133 points and an udder breeding value of 129 points. Both females have been successfully impregnated via embryo transfer and have by now had their first and second calving respectively. What stands out is the fact that these two cows have also been able to confirm their genomically predicted values for performance and conformation.

The genotyping results of the offspring of LEISTE Pp can best be described as a stroke of luck. The seven calves, six of which are genetically polled, have an average TMI of almost 135 points. Particularly outstanding is a polled daughter of EASY with a TMI of 138. Her two full brothers have already been purchased by the Genostar cattle insemination station.

The Steiner family (from left to right): Karin and farmer Martin with their children Stefan, Magdalena and Mathias – Johanna, Tobias, Andreas and farmer Hannes with wife Bernadette





The Steiner family farm in Neusiedl bei Hernstein



LEONDA (sire: WICHTL), a representative of the strong L cow bloodline, which also produced the bull GS MAURIZIO.

Targets achieved

After devoting themselves to polled genetics for more than 15 years, the Steiners can now look back and say, “The road was sometimes rocky, and we had to overcome a few setbacks, but our perseverance paid off in the end.” They were able to achieve most of their goals, and now things are moving in the right direction. Their genetically polled cows are no longer inferior to their horned counterparts in terms of performance and conformation and already account for almost a third of the animals in the herd. Moreover, more than 40 per cent of all calves were born without horns last year. To top it off, some of their young bulls are about to be sent to the insemination station or have recently been sold, while a number of young animals of breeding interest are about to be used for embryo transfer.

The Steiners have not only managed to bring together two families in one business but have also organised their work in such a way that they have the freedom to play an active role in the profession, for example, as elected officials, while at the same time passing on the joys of breeding and farming to their own children.

Thanks to its proven genetics, the Steiner dairy farm is set to continue to make a name for itself in the future. ☺

Farm data

- Family** Farmers Martin and Hannes + wife Karin, parents Anna + Adolf
- Location** Milchhof Steiner, Dorfstraße 33, 2561 Hernstein – Austria
- Altitude** 356 metres above sea level
- Precipitation** 650–750 mm
- Farm size** 55 ha of grassland, 86 ha of arable land and 180 ha of forest
- Livestock** Around 140 cows + 190 female offspring and 20 bulls (for fattening and breeding)
- Feed** AMR (50 % maize and 50 % grass silage, brewer’s grains, concentrates and straw) and max. additional 4 kg of concentrate via a robot
- Type of husbandry** Deep litter, free-stall cubicle barn
- Milking parlour** 3 GEA milking robots
- Memberships** Members of the Performance Control Association and the Breeders’ Association since 1968

Performance over time						
Years	Cows	M-kg	F%	P%	F+P-kg	
1989	23.7	6,389	4.28	3.35	487.6	
2002	60.7	8,768	4.04	3.48	659.7	
2012	129.9	10,372	3.89	3.46	762.3	
2020	138.5	11,453	4.03	3.49	861.4	
2021	143.1	11,204	4.12	3.47	850.9	

- Functional data**
- Age at first calving** 26.4 months
- Performance at first lactation** 9,484 kg of milk
- Insemination rate** 1,7
- Calving interval** 375 days
- Ø TMI of the herd** 113.7, of which 50 are females ≥ 125
- Ø TMI of the calves’ sires** 130
- Ø final performance** 39,618 kg of milk



Roch family farm

A FARM THAT'S STEADILY EXPANDING

Fleckvieh Fattening Farm – Roch family, Tulbing, Lower Austria

MARKUS AND TANJA ROCH – TULBING, AUSTRIA

Initially run as a part-time business by Edeltraud and Ferdinand Roch, the farm became a full-time operation when the family built their own biogas plant in 2004. Since then, the Roch family farm has been steadily expanding.

Located in Tulbing near Tulln, the farm is now run by Markus and Tanja Roch, the second generation of the family. After starting with 30 cattle at the end of 2017, they built a new, modern, animal-friendly barn in 2020 and increased the number of animals to 320. At the same time,

the Rochs began to rear calves in order to maximise the value added per cow.

The barn for fattening cattle consists of cubicles with a paved surface, a manure scraper in the feeding area and litter bedding, and was built in a particularly animal-friendly manner in accordance with the AMA criteria for barn management. It was designed to accommodate 240 bulls. Given the large amount of space available for the animals, the pens had to be designed accordingly. They are littered with short straw using an automatic bedding system, which not only saves time and straw, but also ensures that the manure is dry, flows well and can be easily moved forward by the animals. The Fleckvieh bulls enter the new fattening barn at a live weight of around 200 kg and are sold after about 12 months at a weight of around 730 kg.

The calves are reared in a deep litter pen with a feeding table at the front. Currently, 80 calves are purchased each year, weighing around 85 kg upon arrival. The height of the building allows for a lot of air volume, ensuring excellent air quality in the barn without any draughts. The littered pen can be divided into several sections so that the animals can be easily separated, for instance during cleaning. Height-adjustable covers at the rear of the bedding area make it possible to create a microclimate for the calves. They are fed individually according to their needs by means of an automatic feeder with four stations. From the first day, the calves are offered TMR in parallel with milk replacer.

Using a lot of straw not only means more animal welfare, but also a lot of manure, which is converted into electricity, heat and fermented manure in the farm's biogas

plant. The resulting biogas slurry is spread on the farm's own land to meet the nutrient requirements of the soil. This high-quality liquid fertiliser eliminates the need for synthetic fertiliser and significantly increases the profitability of the farm's crop production. As a result, the Rochs benefit from ideal conditions for growing their own fodder crops, such as maize and barley, and they also cultivate wheat, rape, sugar beet, alfalfa and millet.

The heat generated by the production of electricity is used to operate a drying plant all year round. Depending on the season, this facility is used to dry cereals, hay, alfalfa hay and grain maize, with the latter also serving as feed for the cattle. Thanks to the low temperature, the drying process is particularly gentle to ensure that the feed is of optimal quality. Outside the harvest season, the facility is used to dry wood chips to increase the calorific value of various small private and municipal plants.

Sustainability and the circular economy are very important for the reputation of this

family farm. In order to manage all these labour-intensive activities, the farm's staff comprises the young farmers Markus (35) and Tanja (33) with their two sons (7 and 8 years old), Markus' parents Ferdinand (61) and Edeltraud (59) as well as three external workers.

After rearing the calf Rose alongside various other typical Austrian breeds such as Grauvieh, Pinzgauer, Braunvieh etc., Markus quickly realised the advantages of Fleckvieh. Given Fleckvieh's efficient nutrient uptake with far higher daily gains, coupled with the good nature of the bulls, the higher carcass yield and the higher quality of the meat, the farm's only economic option was to focus exclusively on this particular breed in the future.

All animals are sold via the Lower Austrian Cattle Exchange. The Rochs earn sales premiums thanks to the AMA seal of quality and the food retailer Spar's "mehr Tierwohl Tann Schaut drauf" label. The farm also participates in the Q-Plus quality scheme and the Öpul animal welfare programme. 🐾



Cubicle barn with paved floor, a manure scraper in the feeding area and litter bedding



The farm's outstanding results include Fleckvieh bulls aged 17 months with a carcass yield of over 500 kg, beef quality grade U and fat class 3

Farm data

- Family** Markus and Tanja Roch
- Location** Fam. Roch, Waidwiese 1, 3434 Tulbing – Austria
- Altitude** 206 m above sea level
- Precipitation** 550–600 mm
- Farm size** 180 ha of usable area, of which 155 ha are arable land and 25 ha are grassland
- Livestock** 320 animals for fattening, 80 of which are calves and weaner calves
- Feed** Calves, animals for fattening
 Calves: 6 litres of milk replacer per animal/day via an automatic feeder and TMR made from chopped and dust-free barley straw, barley meal, grain maize meal, dried beet cuttings, soybean meal, linseed meal, fodder molasses and fodder acid
 Share of concentrate feed: initially 80 % before decreasing to 50 %; maize silage: starting at 1 % then increasing to 50 %
 Cattle from 200 kg to 750 kg: TMR consisting of 72 % maize silage, Corn-Cob-Mix, alfalfa hay and concentrate (grain maize, barley meal, soybean meal, rapeseed meal, rapeseed cake, sunflower cake)
- Type of husbandry** Calves: free stall, deep litter
 Weaner calves to final fattening: free stall, litter with sloped floor
- Memberships** ARGE Rind, EZG Streitdorf, TGD NÖ
- Quality schemes** AMA seal of quality, Q-Plus, mehr Tierwohl

Performance over time	Year	Live weight at stabling	Live weight at sale	Time spent in the stable	DWG
	2021	85 kg	730 kg	460 d	1.4 kg/d



Tanja and Markus Roch with their two sons



© Albert Neumayer

The Frühwald herd on pasture with breeding bull BARON from the Barbados bloodline

LEAVE NOTHING TO CHANCE IN BREEDING

Fleckvieh Beef Farm – Frühwald family, Langenschönbichl, Lower Austria

ING. JOSEF FLEISCHHACKER, NOE GENETIK – ZWETTL, AUSTRIA

The Frühwalds are enthusiastic breeders of Fleckvieh cattle in a crop-growing area that is not known for suckler cow husbandry, making it an almost exotic endeavour in this region. On their farm, organic agriculture in harmony with nature is the first priority, and they have 30 years of experience in this field.

Personal details

Roland Frühwald graduated with a degree in structural engineering from the Federal Higher Technical Institute for Education and Experimentation in Vienna and worked

in this sector for several years. His wife Veronika graduated from the Federal Commercial Academy in Tulln and originally worked at a bank. She gave up her job in 2001 and has been an enthusiastic farmer for more than 20 years. Since then, she has been running the farm shop with great dedication. Their two children, Katharina and Lukas, are fully involved in the day-to-day running of the farm. Daughter Katharina is particularly interested in cattle breeding and has an excellent sense of how to handle the animals.

Use of arable land

For cultivation, the family select a wide variety of crops, with a preference for resistant varieties that are suited to the climatic conditions. On a total area of 75 hectares, the family grow potatoes, maize, four different types of cereals and alfalfa. Soil fertility is maintained and continuously improved through crop rotation, green

manure and manure. The farm promotes natural cycles by balancing crop cultivation and animal husbandry in such a way that they complement each other. For this reason, animal husbandry and cattle breeding are an integral part of the farm's philosophy.

Current livestock

“When it comes to animal husbandry, Roland Frühwald attaches great importance to regional breeds”. For this reason, he has opted for Fleckvieh, Austria's very own dual-purpose breed featuring high daily gains and genetically polled bloodlines. The farm is currently home to 44 suckler cows and their offspring. All cows are bred by natural insemination.

Additional livestock

- 100 pigs for fattening
- 1,100 chickens for fattening
- 600 turkeys and 250 geese

History of the farm

- 1980** Date the Frühwalds took over farm
- 1990** Start of farm-gate marketing
- 1993** The farm becomes certified organic
- 1998** Construction of the in-house slaughterhouse
- 2005** Date of joining the NÖ Genetik cattle breeders' association
- 2011** Completion of the free-stall barn

Due to space constraints on the farm, the owner planned and built a free-stall barn with deep litter himself. The aim was to construct an animal-friendly, spacious free-stall barn with the best possible stable climate. The farm is located at an altitude of about 181 metres above sea level, where summers can be very hot and strong winds are common during the transitional seasons. The breeding herd has free access to pasture from spring to autumn. When the calves are about one year old, they are reared on a leased farm in the Waldviertel region, which is also certified organic and has sufficient green areas for grazing.

Breeding strategy

Roland Frühwald is breed spokesman for PURE.BEEF Fleckvieh in Lower Austria and chairman of the breeding committee for Fleckvieh suckler cow husbandry for all of Austria.

“Leaving nothing to chance in breeding” is Roland’s motto, which is why he



The overall winner Britt AT 15 7454 838 from Roland Frühwald’s organic farm at the 2019 Genostar Beef Cattle Day in the Berglandhalle

works tirelessly to promote the Fleckvieh breed together with his fellow breeders at home and abroad. He is convinced of the advantages of genotyping and the joint breeding programme. The wealth of information from the genomic breeding value estimation enables him to select bulls for breeding at an early stage. What he finds especially valuable, for example, is the diagnosis of hereditary defects and the checking of polled status with simultaneous parentage testing. Thanks to the combination of animal-friendly husbandry on straw with sufficient exercise and pasture, the Fleckvieh breed is able to perform at its best on his farm.

2021 farm performance

Calving ease, a calm temperament and high beef performance are very important for the Frühwald farm. For organic farms,

genetic polledness is the icing on the cake when it comes to Fleckvieh-based suckler cow husbandry. In the last reference year, the female calves weighed 37 kilograms and the male calves 39 kilograms at birth. The average weight at 200 days was 286 kilograms for females and 303 kilograms for males. After 365 days, the heifers weighed 341 kilograms and the young bulls 446 kilograms. As a result of the extremely high fertility of the Fleckvieh cows and the Frühwalds’ excellent management, the farm was able to achieve an average calving interval of 353 days.

Success at shows

The herd of this family of Fleckvieh enthusiasts stands out for its calm character and balance. No unkempt or restless animal disturbs the herd, and this is reflected in the performance at cattle shows. At the Genostar beef cattle shows, the Frühwald family’s organic heifers regularly come out on top.

- 2014** The animals presented by the Frühwalds took first place, including the overall winner, the reserve champion and the Fleckvieh show calf with the best musculature.
- 2019** BRITT from the URSUS bloodline was the overall winner among Fleckvieh heifers (see picture).

Farm-gate marketing

The Frühwald family has more than 30 years of experience in direct selling, and their products are highly sought after. In particular, beef from their own production plays an important role. The cattle are slaughtered directly at the farm, after which the meat is allowed to mature for 14 days before it is offered for sale. Their customers are highly satisfied with the excellent quality, and for many of them, Fleckvieh meat is a clear favourite.

What makes the farm so special is the family’s passion for organic farming and cattle breeding. 🍷

Operational Data

Family	Roland Frühwald			
Location	Betrieb Frühwald, Hauptstrasse 67, 3442 Langenschönbichl – Austria			
Altitude	181 metres above sea level			
Precipitation	380 mm			
Farm size	75 ha arable land, 7 ha grassland			
Livestock	44 suckler cows, 6 pregnant heifers, 32 calves, 2 breeding bulls, 26 fattening bulls			
Feeding	Cows: 80 % silage (mix of maize and alfalfa); bulls: 3 kg concentrated; calves: can access concentrated ad libitum			
Barn type	Free-stall barn with paved feeding area; pasture in summer			
Memberships	2005 joined NÖ Genetik cattle breeders’ association			
Performance data	Years	Birth weight (f/m)	DW 200 days (f/m)	DW 365 days (f/m)
	2021	37/39 kg	286/303 kg	341/446 kg
Functional data	Calving rate 101.80			
	Calving interval 353 days			
	Ø age of old cows 6.8 years			
	Easy births 98,30 %			



© Gruber family

Farm of the Gruber family (commonly known as Lemböck) – St. Georgen/Walde, Upper Austria

ONE OF THE MOST MODERN DAIRY BARNS IN AUSTRIA

Dual-purpose Fleckvieh Farm – Gruber family, St. Georgen/Walde, Upper Austria

GÜNTHER HOLZER, RZO – FREISTADT, AUSTRIA

The Gruber family farm occupies a beautiful setting in the municipality of St. Georgen am Walde. An enthusiastic full-time farmer since June 2018, Markus Gruber has also been an RZO official since May 2022. Until May 2022, he was the chairman of the RZO young breeders' association, and as a member of the pool of Fleckvieh judges, he is known far beyond the borders of Austria. In 2019, the Gruber farm won an agricultural prize

awarded by the state of Upper Austria for the “Tierwohlstall 4.0” (Animal Welfare Barn 4.0) project.

The farm

The Gruber family's mountain farm has always been geared towards cattle farming. The first free-stall barn was built in 1996, and the first (used) milking robot was acquired in 2013. Since then, the farm has steadily expanded. After several years of extensive planning and visits to numerous other dairy farms, the Gruber family decided to build a new barn for their dairy cows in 2018.

Innovative new stable

At the end of March 2019 – after a construction period of about six months –

the family was able to inaugurate the new barn, which they built according to their own plans and with a lot of their own labour. Due to the location on a slope, the new barn features a space-saving “basement”, with room for a machine shop and a slurry store with a capacity of 1,350 m³. The barn, which was constructed using 165 m³ of squared timber, boasts 75 feeding stalls, 65 lying stalls and a 100 m² deep litter area. For bedding, the Grubers use the solid parts of separated liquid manure as well as straw pellets. The ceilings and gable walls are insulated, while the south side is open and equipped with windbreak nets. The new barn is divided into four sections (cows being milked, cows at the start of lactation, early dry cows, cows in transit). The old free-stall barn was rebuilt and extended in 2021 and now offers space for 60 heifers and 30 calves.



ASTI (sire: PASSION), group champion in the cow category with three calvings as well as overall winner – 2018 "Rindfleischkirtag" Festival in Freistadt

In the new calf pen, the calves are kept on straw and fed using an automatic feeder



© Luca Noll

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JENNY

(S: GS RAU), reserve winner in the cow category with two calvings at the 2014 AGRARIA fair in Wels
8/7 10,980-3.88-3.49-810 | LY: 91,198

LOISA

(S: WISCHER), reserve champion in the heifer category at the 2017 Rieder fair
+4/3 9,814-3.89-3.60-735



© KeLeKi

© KeLeKi

PINGUIN

(S: PERFEKT)
gTMI 123 / MI 115 / Long 114 / FIT 115 / TOI 120

STOLZE

(S: VLAX), reserve champion in the cow category with two calvings at the 2017 German Fleckvieh Show in Maishofen
7/6 9,777-4.38-3.65-785 | LY: 65,779



From right to left: Markus Gruber and Katharina Kaiselgruber with their parents Rosa and Josef Gruber

Farm data

Family	Markus Gruber and Katharina Kaiselgruber with their parents Rosa and Josef Gruber					
Location	Familie Gruber, Ober St. Georgen 46, 4372 St. Georgen/Walde – Austria					
Altitude	700 m					
Precipitation	700–800 mm					
Farm size	48 ha of land of which 18 ha are forest, 16 ha are leased and 11 ha are used to grow silage maize, with the rest devoted to grassland and feed production					
Livestock	70 dairy cows with 70 female offspring on the farm					
Feed	Enriched mixed ration consisting of grass silage, maize silage and brewer's grains; The cows are fed several times a day using a robot (two to five times depending on the group); five different rations are currently being mixed.					
Stable/milking parlour	Calves are reared on dry TMR and whole milk New dairy barn (inaugurated in March 2019) for 75 dairy cows; 4 sections (cows being milked, cows at the start of lactation, early dry cows, cows in transit); full automation (with milking, feeding and manure scraper robots); a straw area for the transit group, a 1,200 m ³ silage storage facility and a 1,850 m ³ slurry store					
Breeding of young cattle	Free-stall barn (built in 1996, converted and extended in 2021) made of round timber with high stalls and a manure scraper robot; the calves are kept according to the Holstein system on deep litter with an automatic feeder					
Memberships	Joined RZO in 1963					
Performance over time	Years	Cows	M-kg	F%	P%	F+P-kg
	2022	72.4	10,493	4.08	3.44	789
	2021	73.7	10,345	4.04	3.47	777
	2020	72.9	10,932	3.96	3.49	815
	2019	56.8	10,522	4.09	3.60	809
	2018	47.3	10,066	4.18	3.56	780
	2017	45.0	9,912	4.28	3.53	775
Functional data	Calving interval 382 days					
	Insemination rate 1.7 inseminations					
	Cell count 185					

Fully automated

The new dairy barn is fully automated. From feed preparation to feeding, milking and manure removal, hardly any manual labour is required. Ventilation and lighting are also automatically controlled. If necessary, the farm's emergency generator will activate on its own. Markus can control and monitor all functions of the feeding system, the milking robot, the manure scraper robot as well as the lighting and ventilation systems via an app on his mobile phone. In addition, all animal-specific data (e.g. rumination activity) can be monitored via a transponder on the cows' collars, thus providing information on optimal care.

Breeding and marketing

The Gruber family are very active members of RZO. In recent decades, their Fleckvieh breeding farm has developed into one of the association's best-known producers of show cows, with many of their heifers being sold at the Freistadt auction. In total, about 25 of their young cows are sold every year. In the future, the plan is to increasingly sell cows during their second lactation. As of today, the two in-house inseminators Markus and Josef only use the latest and best-performing genomic young sires. This RZO breeding farm also participates in the FoKUHs and D4Dairy projects. By genotyping many young cattle, the Grubers have already identified valuable animals for breeding, such as the young bull PINGUIN (Perfekt x Watt).

The impact of dual-purpose cattle on the farm

For farmer Markus, breeding dual-purpose cattle means stable and healthy cows that combine high milk and carcass yields in a sound manner. It is also very important to him that all calves, regardless of sex, are put to good use rather than being considered "by-products". 🐄

THREE GENERATIONS OF HIGHLY MOTIVATED BREEDERS

Fleckvieh beef farm – Kreil family, Weng im Innkreis, Upper Austria

MAX FRUHSTORFER, FIH – RIED IM INNKREIS, AUSTRIA

The Fleckvieh beef farm of the Kreil family is located in the Upper Austrian dairy district of Braunau, in the municipality of Weng im Innkreis. In a region with an high soil score, it is rare for a farm with a lot of flat land to practise suckler cow husbandry in combination with beef production. Three generations live on the farm, all of them fully committed to the breeding of Fleckvieh beef cattle. Since

2021, the farm's owner has also been the chairman of the beef cattle breeders' association of the Inn- und Hausruckviertel region.

How it started

Until 1997, the farm practised dairy farming with Fleckvieh cattle and fattening of the male animals. In 1995, they started to sell pork, beef and poultry directly to customers with great success. For labour-related reasons, the farm switched from dairy cattle to suckler cows in 1997. In order to find the right beef breed, the family tried out several breeds through artificial insemination. After one Fleckvieh bull from an

acquired group of bulls developed extremely well in 2009, the family decided to focus on beef breeding with polled Fleckvieh cattle.

The farm's breeding philosophy

The family attaches great importance to polledness, ease of calving, a calm character, correct conformation and an appropriate frame with good musculature and high daily gains. These requirements are largely fulfilled by the herd's existing bloodlines, including UNITED Pp, GS GORMO PP, CSW SANDRO PP (father: CSW Santana from the Saenko PP bloodline), CAMPARI PP, STEINADLER PP, ROSENSTOLZ PP (from the Rosenherz PP bloodline), CSW HEKTOR PP. Alongside artificial insemination, the farm also relies on the services of the stud bull BASIC STEINKAUZ PP. Since mutual recog-

Three generations of highly motivated breeders (from left): son Raphael, parents Maria and Raimund, son Thomas with girlfriend Maria





Cow GUNNA – National champion 2016 in Maishofen



KW LUIS PP* – Grand Champion 2019 in Ried im Innkreis

nitiation between dairy and beef breeding is possible in the Austrian herdbook, the farm also uses dual-purpose bulls to safeguard its milk production. The bulls CLOWN PP, HERNANDO PP, ROCKO PP, BW LEWIS PP, REKORD Pp, HERBI PP and STANLEY PP are currently used for insemination. In addition, the farm also relies on dual-purpose stud bulls such as MANOLO Pp, VOTARY PS and WINDOWS PP. Sires from the genetic reserve such as WESPE, BARBAROSSA, RÖMER und RUMENIK are also used in a targeted manner. The passion for and knowledge of breeding of all three generations is particularly noticeable.

Stable type

Since most of the animals are kept indoors all year round, and a small group of cows go out to pasture with their calves, all stables were converted to an animal-friendly deep litter system. Each cow area is equipped with a spacious calf pen.

Feed management

Feeding is delivered by means of a self-propelled silage cutter. The animals have access ad libitum to hay, and all of them are fed mineral feed in the form of paste. From calving to insemination, the cows receive an additional 1 kg of concentrated feed. From the age of 10 weeks until the weaning date, concentrated feed is offered in the calf pen. After weaning, the female animals are given only basic feed, while the male animals additionally receive

up to 2 kg of concentrated feed per day. One group of cows with their calves is on pasture from April to October.

Marketing and sales

The best genetically polled animals are sold as breeding stock throughout Austria and in neighbouring countries. Animals that do not meet the breeding requirements are fattened, slaughtered in the farm's own slaughter and processing room and sold through farmgate marketing. Many of the available breeding animals are sold via word of mouth, www.landwirt.com and the FIH internet sales catalogue.

Success at exhibitions

At the first show in which the farm took part, namely the Young Animal Championship in Wieselburg, Lower Austria, in March 2013, both the males and the females won the muscularity competition. Following this success, the farm has been represented at almost every show in Austria. PAPEY PS, took the title of champion at the 2nd Lower Austrian Beef Cattle Days. At the 2nd Upper Austrian Beef Cattle Show in 2015, the young bull AMBROS PS was crowned state champion.

A first highlight was the 2016 Federal Show in Maishofen, where the cow GUNNA, a daughter of UNITED PP with calf, became national champion while the young bull HEINRICH PP* won the national reserve title.

At the 2019 Genostar Beef Cattle Day in Lower Austria, KW HIAS PP* finished first overall and won the muscularity competition. The next highlight was the 2019 Federal Show where the young bull KW LUIS Pp* won the national title in the male category while the calf KW PEMELA PP* won the national reserve title in the female category.

Future breeding goals

The farm owner's breeding objectives are proven bloodlines with an emphasis on beef, medium frame and good milk yields. Based on the insights gained from direct selling, which revealed differences in the storage of intramuscular fat, Canadian bloodlines (Basic STEINKAUTZ, father: STEINADLER, dam's father: WORLDWIDE) will also be used in the future. Another priority is to create broad awareness of the fact that the only way to improve quality in beef production is to use the best possible sires. ☺

Operational Data

Family	Raphael, Maria and Raimund, Thomas and Maria
Location	Kreil Johannes Raimund, Wernthal 2, 4952 Weng im Innkreis – Austria
Altitude	365 Metres above sea level
Precipitation	1,100 mm
Farm size	97 ha in total, of which 51 ha are arable land (20% maize, 15% sugar beets, 20% soybeans, 35% cereals and 10% clover-grass, with additional catch crops), 46 ha are permanent grassland cut five times a year, and 3.6 ha are woodland
Livestock Membership	79 herdbook cows, 70 young heifers, 37 young bulls Since 1972

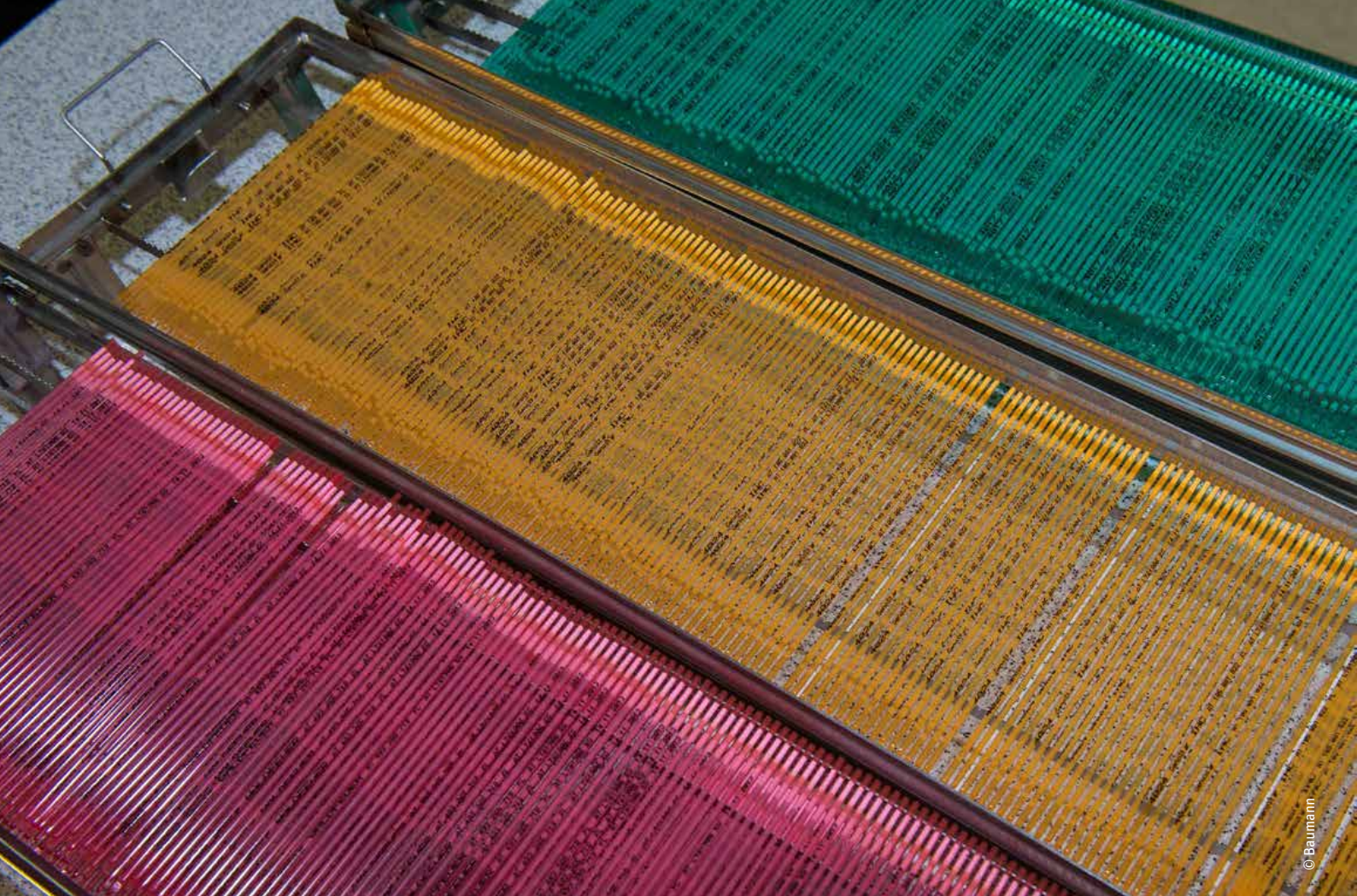
Performance data	Years	Birth weight (f/m)	DWG 200 days (f/m)	DWG 365 days (f/m)
	2021	37 kg/38 kg	1,245 g/1,441 g	1,206 g/1,476 g
	2020	39 kg/40 kg	1,386 g/1,630 g	1,215 g/1,495 g
	2019	38 kg/38 kg	1,415 g/1,550 g	1,173 g/1,471 g
	2018	37 kg/38 kg	1,251 g/1,434 g	1,205 g/1,496 g

Functional data	Longevity/age 6.8 years
	Calving interval 368 days
	Age at first calving 28.7 months
	Calving ease 98.9 % easy births

INSEMINATION CENTERS

**Presentations of current
top Austrian genetics
of the Fleckvieh breed**





Semen deep freezing with quality guarantee

GENOSTAR RINDERBESAMUNG GMBH

Highest quality and the maximum breeding progress

DI PETER STÜCKLER, GENOSTAR – GLEISDORF, AUSTRIA

DR. FRIEDRICH FÜHRER, GENOSTAR – BERGLAND, AUSTRIA

The GENOSTAR insemination organisation is owned by farmers and breeders from the Austrian states of Lower Austria (NÖ Genetik) and Styria (Rinderzucht Steiermark), which are therefore its main areas of activity.

In addition to NÖ Genetik and Rinderzucht Steiermark, our cooperation partners in the Fleckvieh breeding programme are the cattle breeding associations Rinderzucht Salzburg and Rinderzuchtverband Burgenland. In its capacity as a representative of Austrian cattle breeders, GENOSTAR's primary task is to optimise and maximise advances in breeding in the interests of cattle farmers. We therefore run an aggressive

and modern breeding programme for the Fleckvieh breed while using as much information from genotyping as possible. This is based on a population of 130,000 Fleckvieh cows in herds with very different conditions of production, ranging from intensive forage farming to extensive mountain farming areas. We genotype about 2,800 male calves per year. The animals are raised in performance testing stations, with approximately 40 young Fleckvieh bulls going into insemination breeding each year. Together with the breeding associations NÖ Genetik and Rinderzucht Steiermark and our cooperation partners, we aim to breed high-performing, harmonious, well-balanced and fit Fleckvieh cows. In addition to milk yield, the focus is on sires with excellent feet & leg and (above all) udder breeding values. As the most important dual purpose breed and one of the most important dairy breeds worldwide, Fleckvieh also needs to demonstrate optimal advances in breeding for the



Building view of GENOSTAR Gleisdorf (Styria)



Aerial view GENOSTAR Kagelsberg (Lower Austria)

udder trait. The integration of fitness traits into the total merit index has proven to be very successful in the current economic and environmental situation. GENOSTAR offers genetics with clearly positive breeding values for fertility and udder health. These sustainable economic characteristics, combined with Fleckvieh’s optimal carbon footprint due to the combination of milk yield and fattening capacity, make Fleckvieh the breed of the future. Thanks to the rigorous selection of bull dams, the early use of embryo transfer and stringent selection on the male side, GENOSTAR’s breeding programme guarantees advances in Fleckvieh breeding at the highest level. In addition, GENOSTAR offers excellent services in polled breeding, an area where quality trumps quantity.

GENOSTAR operates two cattle breeding and semen production sites, with a total of 160 Fleckvieh bulls. As such, GENOSTAR has the largest market share of Fleckvieh

inseminations in Austria. The bulls are kept alive until the daughters have been tested, given the need to provide sufficient quantities of semen for export markets and the fact that promising and tested Fleckvieh sires are highly sought after. For many years, we have been sharing Fleckvieh bulls with CRV Germany and the Greifenberg insemination station. This cooperation not only increases the options of Fleckvieh breeders, but has also produced some of the best-known sires that have left a mark on Fleckvieh breeding.

Key figures of the breeding programme

- 130,000 herdbook cows
- Insemination rate: 96.7%
- Performance testing capacity (Rosenau and Kalsdorf stations): 180 places
- 3,000 males genotyped each year
- 8,000 females genotyped each year
- Input: 40 young Fleckvieh bulls each year



The best semen for optimal mating

Bull presentation GENOSTAR

September 02nd, 2022
 Genostar Rinderbesamung GmbH
 Kagelsberg 4
 3244 Ruprechtshofen – Austria



© stephanhauser.com

WINTERTRAUM

AT 98 9327 769

A winter dream came true with the birth of this GS WOIWODE’s son



© stephanhauser.com

GS SPUTNIK

AT 65 3730 974

The all-rounder, highest breeding values combined with type and udder



© stephanhauser.com

KIMBERLY

AT 11 8046 868

GS DER BESTE’s daughter and mother of GS HYPOS and GS ZIO



© Guillaume Moy

ZILKE

AT 83 9037 869

GS WOIWODE’s offspring

OBERÖSTERREICHISCHE BESAMUNGSSTATION GMBH

A cradle for top genetics

ANDREAS SELKER, OÖ BESAMUNGSSTATION – HOHENZELL, AUSTRIA

Oö. Besamungsstation GmbH is owned by local farmers and stands for sustainability, genetic diversity and advances in breeding. Together with our export organisation genetic-AUSTRIA GmbH, we address the challenges associated with the production of high-quality food and offer a range of bulls that provide an optimal genetic basis for the company-specific requirements of our customers.

Founded 25 years ago, Oö. Besamungsstation is a joint venture of the breeding associations RZO and FIH. As a market leader in the insemination of cattle, we produce high-quality semen for domestic and international breeding at our facility in Hohenzell, Upper Austria. Every year, we sell about 800,000 portions of semen from more than 1000 different bulls and 20 different breeds. Oö. Besamungsstation offers world-class genetics, especially as regards Austria's dual-purpose Fleckvieh breed, which is why semen from Hohenzell bulls is highly sought after internationally. In addition to the production of semen, the main activities of the insemination station include the implementation of breeding programmes, embryo transfers and the education and training of farmers, pupils, students and international delegations. Under the brand name EUROgenetik, we



The Upper Austrian Insemination Station as a subsidiary of the cattle breeding associations FIH and RZO and as such owned by local farmers stands for sustainability, genetic diversity, and breeding progress.

also work closely with other Austrian and German companies.

Quality creates trust

Every year, Oö. Besamungsstation buys more than 60 of the most genetically promising young bulls. These animals undergo rigorous veterinary examinations that go

Success through quality –
top-quality cattle semen from Hohenzell



far beyond the standards set by the EU. At the same time, our experienced team does its utmost to ensure the well-being of the bulls. Hygiene, maximum care, constant quality controls and the highest veterinary standards guarantee that the frozen semen we produce is of the best possible quality, and our production process is subject to regular external audits.

Well equipped for the future

At the Hohenzell insemination station, sustainability is not only a matter of having our own photovoltaic power supply. When selecting animals for insemination, we also pay special attention to future-oriented hereditary strengths and a high level of genetic diversity. A look at the international ranking of top Fleckvieh sires provides conclusive proof of this fact. EUROgenetik, the world’s largest Fleckvieh insemination association, owns more than 40% of the top 100 daughter-tested bulls. Besides equally well-known polled top stars such as HAMLET Pp* or MOMENTUM PP*, we also offer the semen of WIRBELWIND

P*S, the world’s no. 1 polled Fleckvieh bull. In addition, Oö. Besamungsstation is home to numerous other young sires with excellent genetics that are currently making a name for themselves, such as SUPERBOY, SPIRITUS, MOAB, WILKO, MEDIAN or HERZPOWER.

Success through cooperation

A milestone in the history of Oö. Besamungsstation was the establishment of our subsidiary geneticAUSTRIA GmbH, which we set up together with other Austrian cattle insemination organisations. For two decades, it has served as an expert partner for the international distribution of bovine semen, embryos and breeding stock. Thanks to this extensive cooperation, the genetics of the Hohenzell bulls have already been introduced in 60 countries and are thus known and appreciated all over the world. Together with geneticAUSTRIA, Oö. Besamungsstation is the partner of choice for all cattle breeds, and our customers can continue to rely on us – today and in the future. 🌱



© KeLeKi

A full sister of the world-famous Fleckvieh sire HAMLET Pp* – an exceptional representative of the current breeding population

**Bull presentation
OÖ BESAMUNGSSTATION**

September 03rd, 2022
Oberösterreichische
Besamungsstation GmbH
Dr. Otmar-Föger Straße 1
4921 Hohenzell – Austria



© KeLeKi

At the Hohenzell insemination station, animal welfare is a top priority – our team does its utmost to ensure the well-being of the bulls



© KeLeKi

HAMLET Pp* AT 14 7665 169

A true engine of polled breeding



© KeLeKi

WIRBELWIND P*S AT 73 6267 574

The no. 1 polled bull in Fleckvieh breeding

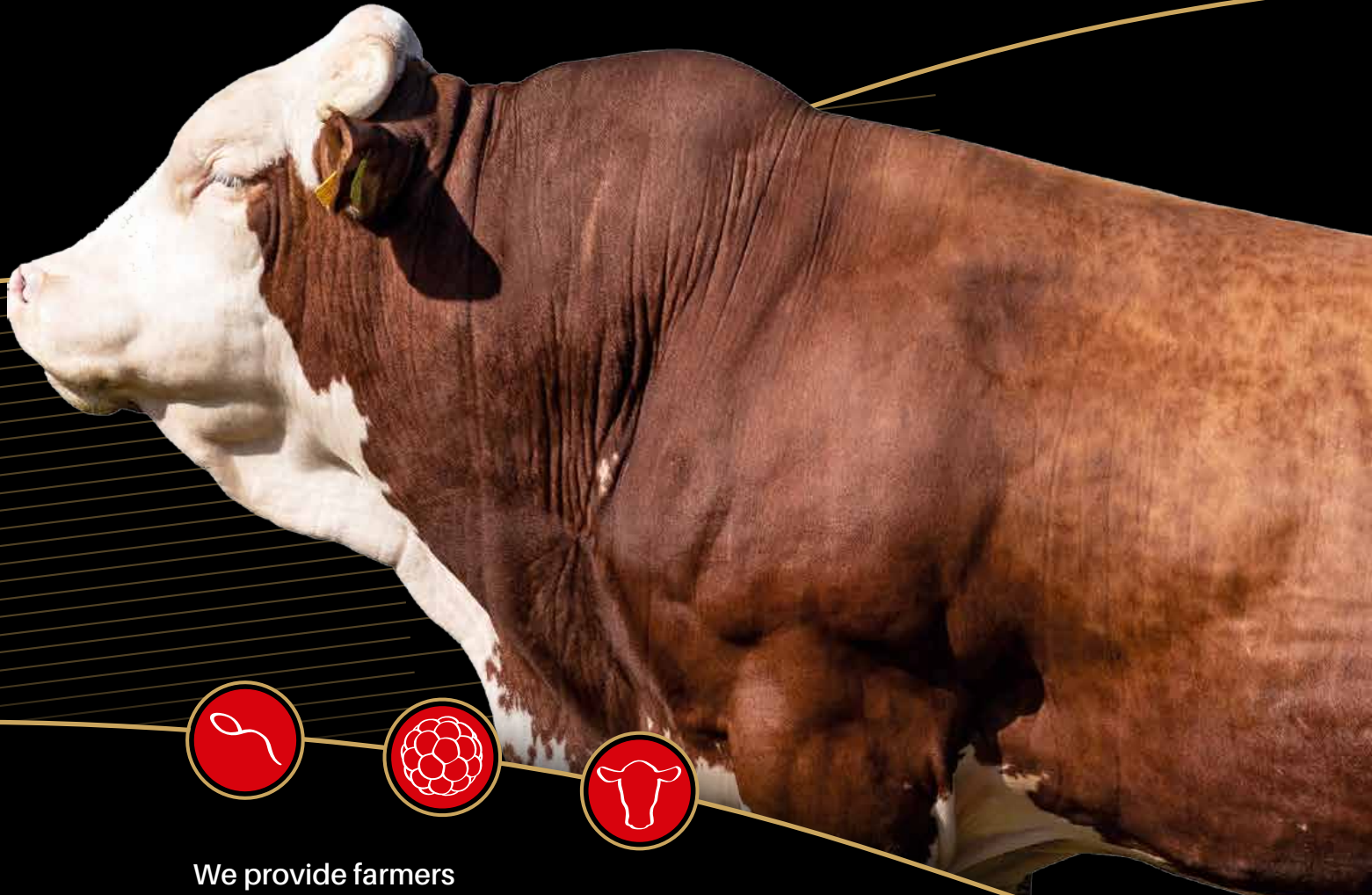


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SUPERBOY AT 46 2742 874

A genetic all-rounder

SEMEN EMBRYOS LIVESTOCK



We provide farmers
worldwide with the basis for a
sustainable and secure future: **Bovine**
semen, embryos and breeding
cattle with top Austrian genetics

SOURCE OF **LIFE**

THE EXPORT
ORGANISATION OF YOUR
INSEMINATION CENTERS



geneticAUSTRIA GmbH

Dresdner Straße 89/B1/18, A-1200 Vienna
Dr. Otmar Föger Straße 1, A-4921 Hohenzell

ZWS08/22

Breeding value estimation
August 2022



Single Traits Main Focus – August 2022

The schedule contains the best 10 bulls, assessed on the basis of individual traits, from a joint list of proven bulls (in brown) and genomic bulls (in blue). The lists are arranged in accordance with relative breeding values as associated with individual traits, total

merit index and milk index. The two best proven bulls have been listed in any event, even if they have not been counted among the top ten.

Rank	Name	Diff.TMI	Rank	Name	MI	Rank	Name	BI	Rank	Name	FIT	Rank	Name	CCI
128	WESTWIND	+5	1	GS WIN AGAIN	141	35	OSSIACH	135	21	WINTERTRAUM	136	35	OSSIACH	130
1	EISENHUT	+4	85	GS HERCULEO	136	97	VILIUS	125	83	MOAB	134	134	WITKOP	128
3	GS HERZTAKT	+4	16	INNCREIS	135	134	WITKOP	123	14	WET WET WET	133	10	GS SPUTNIK	126
8	WEISSENSEE	+4	102	GS WUKSI	135	41	GS WIZZARD	122	84	ERICH	132	16	INNCREIS	126
51	GS MENSUR Pp*	+4	8	HAN SOLO	134	135	GS JEDERMANN	121	4	WIRBELWIND P*S	130	97	VILIUS	125
8	HAN SOLO	+3	2	HIGHNESS	133	27	MAXIMUS	121	11	GS WUNDAWUZI	130	64	SEVENUP	124
28	GS WICKI	+3	9	GS ZIO	133	26	VELTLINER	120	30	SPIRITUS	130	135	GS JEDERMANN	124
59	GS WABANGO	+3	22	GS DELUXE	133	16	INNCREIS	119	33	SALOMOS	130	5	SEBALDUS	123
97	VILIUS	+3	24	HERWIG	133	44	MAHALE PP*	119	47	GS INSTAGRAM	129	24	GS WESTCOAST	123
20	GS ZEBRU	+3	38	MAGNUM	130	12	GS DUPLO	118	12	GS WOIWODE	128	1	EISENHUT	122

Rank	Name	Mkg	Rank	Name	F%	Rank	Name	Fkg	Rank	Name	P%	Rank	Name	Pkg
1	GS WIN AGAIN	+1925	14	VLATURO	+0,47	45	ZACHARIUS	+63	41	GS WIZZARD	+0,16	1	GS WIN AGAIN	+61
63	WAGONEER P*S	+1593	39	GS RENEGADE	+0,38	38	MAGNUM	+59	126	M3 Pp*	+0,15	102	GS WUKSI	+49
85	GS HERCULEO	+1536	3	SUNSHINE	+0,33	136	IMMUNITY P*S	+57	3	SUNSHINE	+0,14	85	GS HERCULEO	+48
26	HOTT	+1528	45	ZACHARIUS	+0,31	3	SUNSHINE	+56	7	VARTA	+0,13	23	HABANERO	+47
102	GS WUKSI	+1511	4	GS ZERO ONE	+0,30	34	MCINALLY	+56	15	HEPHAISTOS	+0,11	24	HERWIG	+47
48	MYANMAR	+1443	136	IMMUNITY P*S	+0,29	20	GS ZEBRU	+56	136	IMMUNITY P*S	+0,11	16	INNCREIS	+46
121	HERZBOMBE	+1436	26	VELTLINER	+0,29	2	HIGHNESS	+55	154	JARON	+0,11	9	GS ZIO	+45
156	WAKANDA	+1432	51	GS HOERI	+0,27	28	GS HELVETIUS	+55	16	INNCREIS	+0,10	8	HAN SOLO	+44
9	HAPPYDAY	+1428	22	VERDEN P*S	+0,26	1	GS WIN AGAIN	+54	91	GS HELOS	+0,10	47	HIGHLAND	+44
48	HARUN	+1328	87	EPIK	+0,21	6	SKIDOO	+53	14	VLATURO	+0,10	13	GS VERY GOOD	+37

Rank	Name	Long	Rank	Name	Pers	Rank	Name	Msp	Rank	Name	UDH	Rank	Name	FEI
33	SALOMOS	135	8	WEISSENSEE	126	24	HERWIG	137	4	WIRBELWIND P*S	131	172	MALTE P*S	130
83	MOAB	134	54	GS WHITESTAR	122	1	GS WIN AGAIN	126	27	MAKAY	131	79	HOFSTIEGER	129
14	WET WET WET	132	88	GS WUHUDLER	122	31	MANAUS	125	37	WANNABE PP*	129	22	VERDEN P*S	128
152	SPARTACUS	131	41	GS RAZFAZ	121	121	HERZBOMBE	124	16	VOLLENDET	129	98	GS SALVATORE	127
11	GS WUNDAWUZI	130	7	GS WINTEN	120	139	VIKINGS PP*	124	19	MAHINDRA P*S	128	168	HABAKUK	127
30	SPIRITUS	130	46	GS MANRIQUE Pp*	120	56	GS MYDREAM	123	126	M3 Pp*	127	21	WINTERTRAUM	126
21	WINTERTRAUM	129	20	GS WEINHEBER	119	93	GS ZAUNKOENI	123	14	WET WET WET	126	118	WAHRSAGER	126
26	HOTT	129	43	GS WEGA Pp*	119	109	GS HOHENAU	123	120	GS WHIRLPOOL	126	77	GS ZENOS	125
12	GS WOIWODE	128	109	GS HOHENAU	119	110	HEGEL	123	13	WEITWEG	125	84	ERICH	125
37	MANOLO Pp*	123	48	HARUN	119	130	MARIUS	122	1	EISENHUT	123	40	VADUZ	122

Rank	Name	VIT	Rank	Name	CLVp	Rank	Name	CLVp	Rank	Name	Fert	Rank	Name	FR
2	HIGHNESS	122	2	GS HIERHER	125	155	GS WEG FREI	124	165	WILDHARZ	+9%	139	VIKINGS PP*	122
94	GS SPOTIFY	121	21	WINTERTRAUM	120	17	WINDSPIEL	118	81	GS HELLSTORM	+6%	6	WOMBAT	121
5	SEBALDUS	120	131	GS MY BEST Pp*	120	51	GS MENSUR Pp*	118	51	GS MENSUR Pp*	+5%	168	HABAKUK	119
10	GS SPUTNIK	120	147	GS WECHSEL	120	59	GS WABANGO	117	15	HEPHAISTOS	+4%	50	ETHOS	119
15	VENIER	120	51	GS HOERI	119	121	HERZBOMBE	117	138	ESRA	+4%	39	JEDI	118
36	MAJOR P*S	120	39	GS RENEGADE	119	132	MADERNO P*S	117	146	GS WORKAHOL	+4%	96	HORAZIO P*S	118
33	SALOMOS	119	81	GS HELLSTORM	117	8	HAN SOLO	116	7	GS WINTEN	+3%	98	GS SALVATORE	118
61	MCFIRE	119	10	GS SPUTNIK	116	137	BERGFEST	116	78	WETTINER	+3%	99	WEIX	117
64	SEVENUP	119	33	SALOMOS	116	44	MAHALE PP*	116	42	GS MUNDL PP*	+3%	94	GS SPOTIFY	116
72	HERMO	119	39	JEDI	116	46	GS MANRIQUE Pp*	116	21	WINTERTRAUM	+2%	133	ERASMUS	116

Rank	Name	MU	Rank	Name	FL	Rank	Name	UD	Rank	Name	UDD	Rank	Name	Add
17	WINDSPIEL	126	37	MANOLO Pp*	134	150	EPIKUR	136	150	EPIKUR	135	109	GS HOHENAU	111
42	GS MUNDL PP*	126	21	WINTERTRAUM	127	21	GS DER BESTE	133	94	GS SPOTIFY	128	70	WUESTENSOHN	110
130	MARIUS	123	12	GS WOIWODE	124	50	HERZPOWER	132	96	HORAZIO P*S	128	26	HOTT	109
70	WUESTENSOHN	122	149	WOLFELSEE P*S	123	133	ERASMUS	131	52	HYPNOSE	125	63	WAGONEER P*S	109
1	EISENHUT	121	101	MAJESTIX P*S	121	94	GS SPOTIFY	129	133	ERASMUS	124	99	WEIX	109
5	WORLD CUP	118	58	SUPERBOY	120	10	GS SPUTNIK	128	148	GS HANDSOME	124	118	WAHRSAGER	109
100	GS ELGAR	117	84	ERICH	120	44	GS EL TORO	127	91	GS HELOS	123	64	SEVENUP	108
128	WESTWIND	117	123	MARIAN	120	11	GS WUNDAWUZI	126	98	GS SALVATORE	123	97	VILIUS	108
172	MALTE P*S	117	140	GS MUCKI	120	40	GS DEFACIO	126	21	GS DER BESTE	123	24	HERWIG	108
51	GS MENSUR Pp*	117	162	GS MYDARLING	120	17	WINDSPIEL	122	50	ETHOS	121	5	WORLD CUP	107

Toplist by Total Merit Index – Proven Bulls

This top list contains all available proven bulls that are owned/co-owned by the Austrian insemination centers, meet minimum criteria defined by Fleckvieh Austria and are allowed to be exported by geneticAUSTRIA.

Identification data		Partial breeding values					Milk/Conformation			Beef	Fitness					Absolute performances indicators						
Rg	Name	ID	TMI	MI	BI	FIT	TOI	Mkg	F%	P%	CCI	Long	UdH	ZZ	Mas	Int-Dau	Farm	D100	Mkg	F%	P%	ØHd
	Sire / Dam's sire	Genet. def.	Re	Re	Re	Re	Re	Fkg	Pkg	NDG	Pers	FEI	Bef	EFD	in 1.L	MP1	D1					Mat
	YoB, Foreign	Genet. def.	Diff	Diff	Diff	Diff	Diff			CARC	Perf	CLV p	CLV m	Cyst	in 2.L	MP2	D2					
	At Center	Availability							FR-MU-FL-UD-(Add)	TRC	Msp	VIT	MiBe	MiFe	in 3.L	MP3	D3					
*1	EISENHUT AT 92 1271 838 ETOSCHA / GS WOHLTAT 2017 Eu, A8, 6, A3	J	138 116 118 126 135 86 93 96 85 89 +4 +5 -2 -1 +2	+701 -0,14 +0,02 +17 +27	122 97 123 96 109 96 114 94	115 74 123 88 125 86 111 63 107 89 119 75 0 104 71 107 78 104 98 110 85 104 69 86 91 107 90 100 71 109 47	41 34 41 3 0 0 0 0	22 2812 4,15 3,37 0 0	8639 102,8													
2	GS HIERHER AT 65 5295 338 GS HENDORF / REUMUT 2017, 8 % RF A1	J	137 121 111 119 136 90 97 98 89 92 0 -3 0 +3 0	+663 +0,09 +0,04 +36 +27	118 98 101 98 120 97 100 97	110 76 106 93 107 93 104 67 111 96 117 80 0 108 77 118 78 125 98 97 90 109 73 105 96 116 91 115 81 113 69	235 156 235 3 0 0 0 0	106 2781 4,21 3,29 2 0 0	8667 101,4													
3	GS HERZTAKT AT 91 3133 329 HERZSCHLAG / VLAX 2016, 6 % RF A1	J	136 124 108 113 133 96 99 99 95 97 +4 +3 -1 +3 +2	+1058 -0,03 -0,10 +42 +29	113 99 104 99 105 99 109 99	103 87 113 97 114 98 105 84 118 99 104 92 1 101 91 107 88 110 99 103 97 104 89 103 99 112 97 111 93 122 92	1005 697 1005 5 159 3 0 0	805 2850 4,03 3,15 281 7809 4,24 3,38 0	8749 100,5													
4	GS ZERO ONE DE 09 52479429 ZEPTER / WATT 2016, 5 % RF A1	J	135 122 116 113 128 91 97 97 90 93 -3 -1 -1 -3 -3	+449 +0,30 +0,07 +44 +22	110 97 105 97 118 97 110 96	112 79 113 93 113 93 109 69 96 96 111 83 0 109 79 105 81 93 97 104 90 110 77 100 96 98 88 105 81 116 69	175 134 175 6 38 2 0 0	159 2847 4,12 3,21 77 7668 4,38 3,50 0	8713 101													
5	WOMBAT DE 09 52729613 WOBBLER / MELCHIOR 2017, 5 % RF Eu, A3, 6	J	134 118 110 119 129 89 96 95 87 91 -3 -2 -1 -2 -2	+1062 -0,32 -0,05 +15 +33	113 96 118 95 104 96 105 93	114 76 115 92 115 91 113 65 105 94 115 78 0 102 75 105 76 106 96 110 88 105 73 101 94 101 85 99 78 105 61	119 100 119 6 2 2 0 0	100 2836 3,93 3,19 20 6964 4,07 3,46 0	8639 102,8													
6	WEISSEENSE AT 36 4261 168 WABAN / VULCANO 2017 Eu, A8, 6, 27, A3	J	132 121 100 116 131 96 99 99 96 97 +4 +3 -1 +1 +4	+988 -0,11 -0,07 +31 +29	102 99 103 99 97 99 101 99	108 87 121 97 123 98 109 83 126 99 103 93 0 99 92 104 78 103 99 97 98 97 87 109 99 102 99 97 94 121 91	1203 886 1203 3 0 0 0 0	495 2914 4,04 3,29 2 0 0	9068 102,3													
7	GS ENJO AT 65 7692 729 GS ELVIS / POLARBAER 2016 A1, 17	J, V	131 116 110 116 128 97 99 99 96 97 -2 -1 -1 0 -2	+903 -0,22 -0,06 +18 +26	108 99 103 99 112 99 106 99	114 89 113 98 112 99 114 81 106 99 111 93 2 101 91 113 95 102 99 111 97 107 89 101 99 97 96 104 91 113 92	1325 762 1325 7 403 3 1 2	892 2677 4,04 3,19 537 7297 4,15 3,44 6 8551 4,07 3,54 0	8299 96,7													
8	GS WOIWODE AT 93 4843 838 WOBBLER / RALDI 2017, 6 % RF A1, 2, 17	J	131 112 96 128 135 92 97 99 91 94 +1 +1 -4 -1 +2	+831 -0,23 -0,11 +14 +20	98 99 89 99 99 99 101 99	128 80 117 94 115 94 117 72 113 96 119 85 2 112 83 109 77 104 99 103 95 110 77 112 97 105 98 102 85 116 73	337 247 337 2 0 0 0 0	80 3144 3,83 3,25 0 0	9910 106,2													
9	GS VERY GOOD AT 50 1795 129 VALEUR / REUMUT 2015, 8 % RF A1	J	130 124 100 110 127 93 98 97 93 95 -1 0 -1 -1 -1	+1111 -0,15 -0,03 +32 +37	102 98 103 98 102 96 97 97	112 84 104 95 101 95 110 75 103 98 103 97 110 88 0 107 84 113 95 113 98 109 92 103 83 108 96 91 91 98 82 111 82	207 170 207 8 164 7 50 3	200 2808 3,89 3,14 178 7541 4,09 3,38 84 8597 4,18 3,50 0	8360 95													
10	VENIER AT 63 0711 338 VESUV / REUMUT 2017, 7 % RF Eu, A3, 6, A8	J, J, N	130 119 107 113 127 90 97 96 89 92 0 +1 0 -2 0	+968 -0,17 -0,06 +25 +29	115 97 109 97 115 96 93 96	113 77 108 93 110 93 102 66 110 96 101 81 2 96 77 116 77 115 97 101 90 109 74 89 95 120 88 92 80 107 69	178 161 178 6 5 2 0 0	148 2569 4,08 3,26 41 7231 4,21 3,50 0 0	8135 98,7													
11	VOLLENDT DE 09 51394297 RALDI / WEBURG 2016, 13 % RF Eu, A3, 6, A5	E	130 118 88 122 128 97 99 99 96 98 0 -1 -1 0 0	+832 -0,08 -0,04 +28 +26	91 99 93 99 90 99 91 99	118 90 129 98 128 98 124 85 95 99 111 94 2 104 92 112 95 105 99 111 98 110 91 103 99 99 98 96 94 118 93	1176 856 1176 6 327 4 0 0	1047 2853 3,95 3,19 547 7512 4,23 3,49 5 8362 4,41 3,77 0	8520 99,1													
12	MANNA AT 87 4572 229 MAHANGO Pp* / JANDA 2016 Eu, A3	J	129 122 113 104 118 91 97 96 90 93 -1 -2 -1 0 -1	+1040 -0,13 -0,04 +31 +33	116 97 121 97 104 97 111 95	107 79 107 93 107 93 105 70 92 96 100 83 -2 110 80 96 88 100 97 107 90 88 78 110 95 102 87 105 80 110 73	186 129 186 6 55 4 0 0	144 2876 4,07 3,17 86 7560 4,21 3,43 0	8152 96,7													
*13	GS ZEBRU AT 33 5898 228 ZEPTER / DAX 2017, 5 % RF A1	J	128 125 108 102 121 87 95 96 86 90 +3 +4 -1 -1 0	+932 +0,18 -0,14 +56 +20	106 97 106 97 111 96 101 96	108 74 102 90 105 89 92 62 90 92 98 76 -1 106 73 108 78 94 97 109 87 102 69 121 94 104 88 104 75 116 56	89 79 89 3 0 0 0 0	43 3030 4,24 3,06 0 0	8860 99,6													
14	GS DER BESTE AT 51 4740 229 DAX / REUMUT 2016 A1	J	128 124 100 107 129 98 99 99 98 99 +2 +2 -1 +2 +2	+869 +0,05 -0,01 +41 +30	100 99 99 99 109 99 92 99	108 94 107 99 105 99 109 92 109 99 101 97 0 91 96 111 98 107 99 115 99 106 95 99 91 96 99 91 96 120 97	2121 1293 2121 7 943 5 37 2	1962 2733 4,19 3,24 1291 7587 4,32 3,45 132 8917 4,34 3,58 0	8777 97,8													
15	HERWIG AT 79 4839 429 HERZSCHLAG / WILLE 2016 Eu, A3	J	127 133 111 88 115 90 96 94 90 92 -2 0 -1 -2 -3	+1209 -0,03 +0,05 +47 +47	111 96 113 95 108 96 105 93	91 80 89 93 89 92 91 71 89 94 92 83 -4 104 78 89 85 101 96 110 88 98 78 137 95 102 84 103 79 120 66	95 77 95 7 49 4 0 0	90 2831 4,25 3,27 72 7453 4,28 3,50 0	8096 97,4													

WOMBAT



© Andreas Selker

Breeding Value:

gTMI 134 (89) | BI 110 (95) | FIT 119 (87) | TOI 129 (91)
MI 118 (96) +1,062 -0.32 +15 -0.05 +33

Hereditary transmission: This daughter-tested dual-purpose sire with excellent fitness has turned out to be an absolute top sire among the proven bulls in the current breeding value estimation. He produces incredibly large frames as well as milk and meat at a high level. Due to his dam's sire MELCHIOR, WOMBAT has a slightly different pedigree, making him the son of WOBLER with the highest breeding value. Though his milk solid inheritance is a little weaker, fitness traits are among his great strengths. Both on the paternal and maternal side, he combines excellent udder health with outstanding fertility and calving traits.

DE 09 52729613

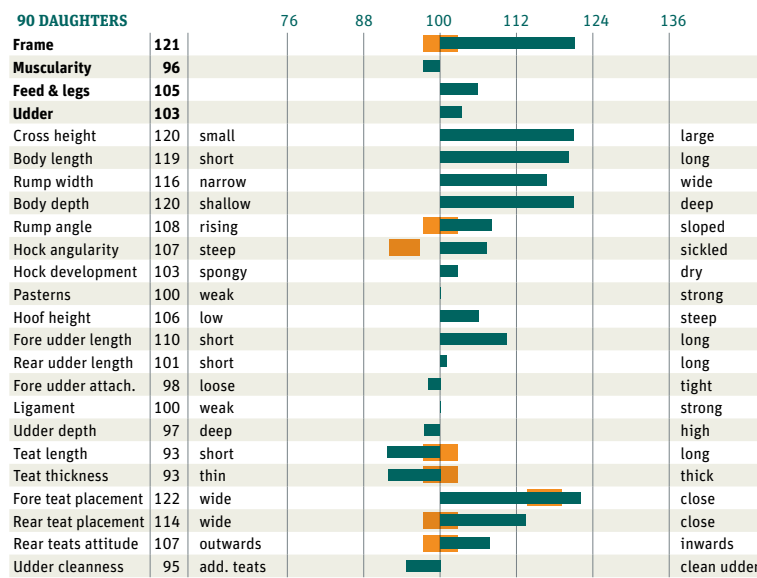
EUROgenetik; OÖ Besamungsstation; Neustadt/Aisch

Breeder: Josef Seilbeck

84424 Isen/De

DESCENT			
WOBLER	DE 09 46673832	WATNOX	DE 09 38662295
Index: 125 / 112 / +731 -0.24 -0.05		SINDI	DE 09 41277398
RILA	DE 09 50065843	MELCHIOR	DE 09 45893915
Index: 118 / 123 / +731 +0,07 +0,03		RINNISE	DE 09 47410957
1/1 - 9,642-3.88-3.04-667		2/2 - 10,210-3.91-3.69-776	
HL: 1. - 9,642-3.88-3.04-667			

CONFORMATION-BREEDING VALUE 121 – 96 – 105 – 103 (93)



■ = optimal range

WEISSENSEE



© Keléki

Breeding Value:

gTMI 132 (96) | BI 100 (99) | FIT 116 (95) | TOI 131 (97)
MI 121 (99) +988 -0.11 +31 -0.07 +29

Hereditary transmission: Is currently the best daughter-tested son of WABAN. His daughters confirm the trust placed in him! His first female offspring in lactation have confirmed the high expectations placed in his above-average udder inheritance. With an udder breeding value of 118 he offers the best udder genetics of all sons of WABAN. This solid performance is emphasized in particular by high levels of persistency and his excellent breeding value for udder health. WEISSENSEE produces medium-framed and hassle-free cows with good fitness traits.

AT 36 4261 168

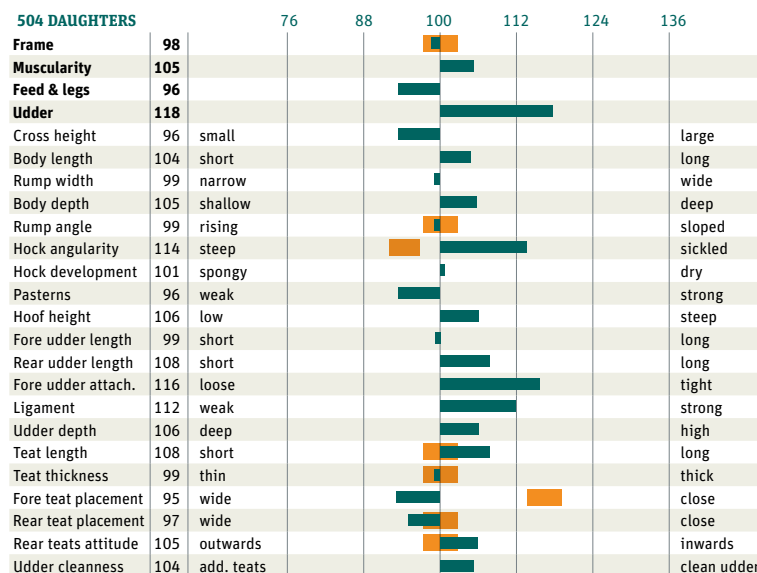
EUROgenetik; caRI; OÖ. Besamungsstation; N./A.; RBW

Breeder: Franz Zmug

9431 Wolfsberg

DESCENT			
WABAN	AT 80 6062 819	WILLE	DE 08 14101128
Index: 131 / 118 / +703 -0.08 +0.05		GISELLA	DE 09 46878899
LUXA	AT 37 3871 322	VULCANO	DE 09 45875179
Index: 110 / 107 / +185 -0.01 +0.06		LOCKI	AT 16 9399 217
3/2 - 9,193-4.39-3.68-742		5/4 - 8,431-5.08-4.01-766	
HL: 2. - 10,576-4.37-3.69-852			

CONFORMATION-BREEDING VALUE 98 – 105 – 96 – 118 (98)



■ = optimal range

GS WOIWODE



© stephanhauser.com

Breeding Value:

gTMI 131 (92) | BI 96 (99) | FIT 128 (91) | TOI 135 (94)
MI 112 (97) +831 -0.23 +14 -0.11 +20

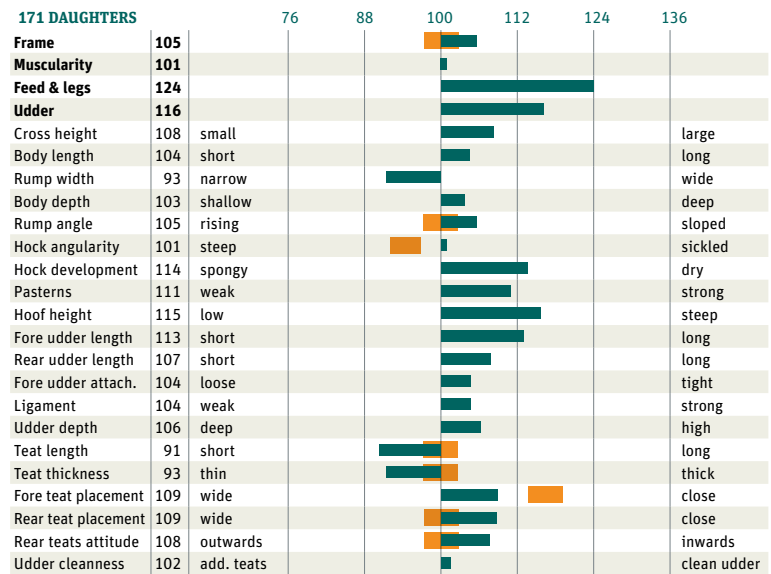
Hereditary transmission: With his very strong performance, this genomically typed young bull confirms the expectations placed on him. In particular, his daughters stand out in terms of their longevity, fertility, udder health and milking speed traits, which is reflected in his total merit index of 131 points. He is the product of the combination of two proven bulls with strong fitness values, his sire WOBBLER and his dam's sire RALDI. He exhibits the best udder inheritance of all sons of WOBBLER. Overall, his hereditary power is mainly focused on the feet & legs and udder breeding values.

AT 93 4843 838
GENOSTAR; CRV; Greifenberg

Breeder: Notburga a. Martin Ederer
3251 Purgstall

DESCENT			
WOBBLER	DE 09 46673832	WATNOX	DE 09 38662295
Index: 125 / 112 / +739 -0.24 -0.05		SINDI	DE 09 41277398
LAUSSA	AT 71 1596 529	RALDI	DE 09 44108728
Index: 110 / 104 / +230 -0.02 -0.04		LIECHTENSTEIN	AT 22 4771 328
5/4 - 10,183-4.31-3.38-783		3/3 - 9,208-3.94-3.28-665	
HL: 4. - 11,390-4.43-3.22-870			

CONFORMATION-BREEDING VALUE 105 - 101 - 124 - 116 (95)



■ = optimal range

GS DER BESTE



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Breeding Value:

gTMI 128 (98) | BI 100 (99) | FIT 107 (98) | TOI 129 (99)
MI 124 (99) +869 +0.05 +41 -0.01 +30

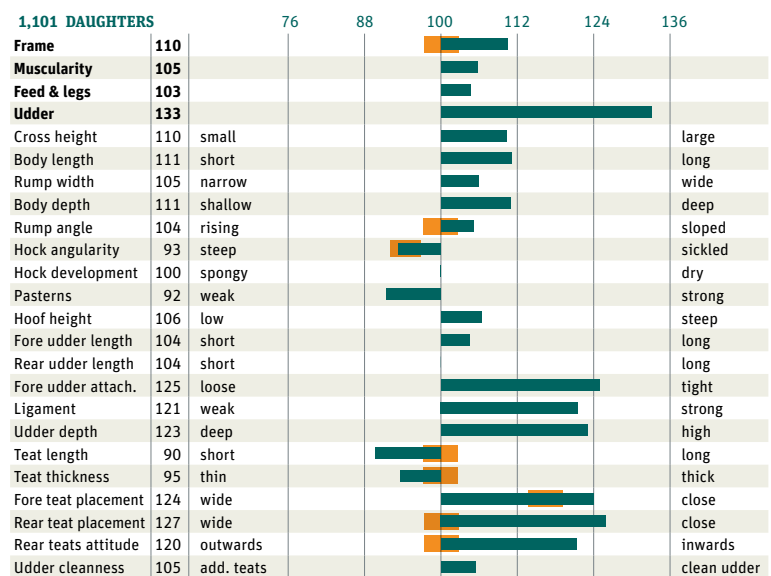
Hereditary transmission: With more than 2,000 daughters, GS DER BESTE has conclusively proven his hereditary strength. He offers some of the best udder genetics in Fleckvieh breeding, resulting in a uniform cow type. Thanks to their well-proportioned medium frame, his daughters are currently the benchmark for udder quality in Fleckvieh breeding. Their udders feature a flat transition to the abdominal wall, are ideally suspended and stand out for their perfectly placed teats. Given his favourable calving characteristics, GS DER BESTE continues to be a popular bull for insemination, laying the foundation for hassle-free, beautiful cows and heifers.

AT 51 4740 229
GENOSTAR

Breeder: Heidemarie Ferstl
8793 Trofaiach

DESCENT			
DAX	DE 09 48300739	DELL	DE 09 74602964
Index: 114 / 116 / +506 +0.07 +0.03		ROMVANY	DE 09 42047442
KALLA	AT 91 1733 722	REUMUT	DE 09 44127123
Index: 115 / 115 / +597 +0.00 -0.05		KAMERUN	AT 21 7848 717
7/6 - 10,629-4.47-3.36-832		9/8 - 9,299-3.89-3.38-677	
HL: 3. - 12,203-4.69-3.25-968			

CONFORMATION-BREEDING VALUE 110 - 105 - 103 - 133 (99)



■ = optimal range

Toplist by Total Merit Index – Genomic young bulls

This toplist contains all available genomic young bulls that are owned/co-owned by the Austrian insemination centers, meet minimum criteria defined by Fleckvieh Austria and are allowed to be exported by geneticAUSTRIA.

Rg	Identification data			Partial breeding values					Milk			Beef		Fitness					Conformation						
	Name ID	YoB, Foreign	Al Center	TMI	MI	BI	FIT	TOI	Mkg	F%	P%	NDG	Long	UdH	SCC	FEI	FR	MU	FL	UD					
	Sire / Dam's sire	Al Center	Availability	Re	Re	Re	Re	Re	Fkg	Pkg	CARC	Pers	CLV p	CLV m	Bef	Re			Add						
	Genet. def.			Diff	Diff	Diff	Diff	Diff			TRC	Perf	Msp	Msp	MiBe										
*1	GS WIN AGAIN AT 63 5520 774 WONDERBOY / WORLDCLUP	2021, 7 % RF A1, 17, 2 E, G, E		151 70 new	141 81 new	112 67 new	114 75 new	148 77 new	+1925 +54 106	-0,27 +61	-0,08 106	112 109 65	68 67 75	125 113 124	63 72 67	105 107 115	77 74 62	105 108 126	72 67 80	93 101 54	62 67 54	97 76	95 104	105 104	113 104
2	WIRBELWIND P*5 AT 73 6267 574 WAALKES Pp* / SISYPHUS	2021 Eu, A3, A5, A8, 27, 6 J		144 72 0	128 81 +1	103 70 -4	130 77 +1	139 79 0	+1213 +39 101	-0,12 +38	-0,06 106	101 106 101	72 70 68	126 105 104	66 73 69	131 110 108	78 78 69	132 110 109	73 73 80	112 110 108	65 73 55	100 77	106 104	104 95	119 119 95
*3	SEBALDUS AT 47 6068 274 SPARTACUS / MOGUL	2021 Eu, A3, 27 J, J, G		144 73 new	126 82 new	117 72 new	126 78 new	143 80 new	+1226 +37 111	-0,15 +35	-0,09 106	113 115 111	73 72 71	127 107 116	66 73 70	117 102 120	79 80 70	119 102 94	119 73 81	73 110 103	66 73 57	104 78	100 104	105 104	119 104
4	GS WINTEN AT 95 1695 369 WEISSENSEE / GS WRIGLEY	2020 A1 J		143 78 +1	126 87 0	104 76 -2	126 82 0	135 84 +1	+1178 +37 100	-0,13 +37	-0,05 +37	109 103 100	77 77 75	126 120 101	72 80 73	116 103 99	84 91 74	116 104 120	80 77 86	114 +3% 103	73 67	106 84	103 105	99 111	111 105
*5	GS ZIO AT 01 6228 974 ZEIGER / GS DER BESTE	2021 A1 J		142 72 new	133 81 new	103 70 new	123 77 new	137 79 new	+1331 +47 97	-0,09 +45	-0,03 105	107 105 97	71 69 67	122 109 115	66 73 69	119 88 92	78 79 68	115 111 103	115 72 80	114 112 95	65 65 54	103 77	89 101	101 117	117 101
6	GS SPUTNIK AT 65 3730 974 SPARTACUS / VARTA	2021, 4 % RF A1, 17, 2 E, E, E		142 72 -3	125 82 -1	115 72 -4	125 77 0	138 79 -2	+882 +37 110	0,00 +32	+0,01 106	114 112 110	73 70 73	124 94 96	66 73 70	108 116 120	78 80 69	107 107 104	73 73 80	120 107 97	65 73 55	105 77	105 102	106 102	128 102
7	GS WUNDAWUZI AT 19 5270 174 WESTWIND / GS DER BESTE	2020 A1, 17 J		142 73 +1	125 83 -1	103 76 0	130 78 +2	143 80 +2	+1101 +35 100	-0,12 +36	-0,03 107	99 107 100	77 74 73	130 114 115	67 74 72	118 103 100	79 81 71	115 115 107	74 73 82	117 73 100	66 66 58	103 79	107 105	103 105	126 105
8	GS DUPLO AT 45 2848 574 GS DEFACIO / GS WATTKING F5C	2020 A1 J		142 73 0	120 82 0	118 73 -1	128 78 +2	140 80 +1	+677 +29 104	+0,01 +27	+0,03 104	111 125 104	74 74 73	127 96 109	66 74 71	114 101 109	79 80 69	113 110 113	74 72 81	122 107 96	66 72 57	99 78	102 104	105 104	114 104
9	GS WLADI AT 71 3571 869 GS WOIWODE / VARTA	2019, 8 % RF A1 J		140 75 0	128 85 0	96 74 -4	129 79 +1	136 81 0	+1271 +40 99	-0,14 +40	-0,06 101	87 101 99	76 74 72	120 111 107	67 77 70	117 105 114	81 89 71	116 109 95	76 74 82	120 107 101	67 67 59	89 80	98 109	109 101	110 101
10	HALLOUMI AT 72 2050 374 HELIKON / ZAZU	2021 Eu, A3 J		140 71 +1	126 81 +2	117 69 -4	119 76 +2	138 78 +1	+925 +44 107	+0,06 +30	-0,03 107	105 122 67	70 69 112	119 112 68	65 73 116	108 115 88	78 79 116	109 102 80	73 70 96	110 70 55	64 64 56	92 77	95 104	109 106	109 106
*11	MAHINDRA P*5 AT 72 3751 474 MERCEDES Pp* / WOBLER	2021 Eu, A3 J		140 72 new	126 81 new	97 72 new	128 77 new	136 79 new	+1183 +34 100	-0,16 +39	-0,04 107	107 92 100	74 73 71	124 108 104	66 73 69	128 114 114	78 80 70	132 105 99	72 73 80	109 73 106	66 66 54	114 76	108 104	114 104	117 104
12	GS WEINHEBER AT 45 2878 274 WESTWIND / GS HERZBLATT	2021 A1 J		140 72 +2	123 82 +1	114 72 +2	122 77 +1	141 79 +2	+856 +35 111	0,00 +29	-0,02 110	114 110 111	74 73 71	121 119 119	66 73 69	113 99 104	78 80 70	113 109 117	73 72 81	108 109 96	65 72 56	104 78	105 106	109 106	111 106
13	WINTERTRAUM AT 98 9327 769 GS WOIWODE / GS DER BESTE	2019 A1, 2, 17 E		140 77 -2	118 85 -1	102 80 -5	136 81 -1	145 83 -1	+1092 +20 101	-0,28 +29	-0,10 106	94 106 101	81 80 78	129 111 107	69 77 70	122 120 111	82 110 88	120 110 115	77 83 84	126 76 97	70 +2% 61	102 81	90 101	127 101	124 101
14	GS DELUXE AT 10 4570 274 GS DEFACIO / HERZSCHLAG	2020 A1, 2, 17 J		139 74 -2	133 84 -1	111 76 -4	110 79 0	129 81 -2	+1074 +53 102	+0,09 +41	+0,03 107	123 107 102	78 75 74	104 97 103	68 75 72	114 97 100	80 80 71	109 108 110	75 73 83	107 73 103	68 60	114 80	101 101	108 101	113 101
15	GS WESTCOAST AT 38 2306 974 WUESTENSOHN / HERZSCHLAG	2020, 9 % RF A1 J		139 73 0	131 82 +1	117 74 -3	111 78 0	131 80 0	+1195 +43 114	-0,07 +43	0,00 106	122 106 114	75 74 72	112 97 105	66 74 70	112 110 104	79 79 70	112 103 106	74 73 81	104 74 101	66 66 57	103 78	116 107	111 107	110 107
*16	GS MAIZAUER AT 53 1988 374 GS MOJOS / GS HERZTAKT	2021 A1 E		139 70 new	126 81 new	103 67 new	126 75 new	137 77 new	+1031 +40 102	-0,03 +34	-0,03 105	99 105 102	68 67 66	121 112 114	63 72 67	121 111 110	77 76 64	122 107 101	72 68 101	110 79 105	62 68 54	94 76	94 107	103 107	112 107
17	GS WICKI AT 81 2003 969 GS W1 / VARTA	2020, 5 % RF A1 J		138 77 +3	124 86 +3	105 74 -2	124 80 +2	134 82 +2	+1122 +29 101	-0,19 +36	-0,04 109	99 109 101	75 75 73	118 109 110	69 79 72	115 111 106	83 80 71	116 110 111	79 75 85	117 110 91	70 70 64	96 82	105 100	101 100	110 100
18	WILKO AT 85 7214 169 GS WOIWODE / WABAN	2020, 5 % RF Eu, A3, 6, A8, A5, 27 J		138 77 -2	124 86 -1	102 75 -4	126 80 +1	135 83 -1	+1274 +31 104	-0,24 +35	-0,11 103	91 103 104	76 77 74	120 112 108	68 78 71	114 98 113	82 97 80	112 110 115	78 79 84	117 0% 94	69 62	104 81	101 104	107 104	106 104
19	SPIRITUS AT 46 2734 874 SPARTACUS / ZAZU	2020 Eu, A3, A5, 27, 6 J		138 72 0	122 81 +1	106 72 +1	130 77 +1	140 79 +1	+824 +33 98	-0,02 +28	-0,01 115	95 115 98	73 72 70	130 100 117	66 73 68	121 112 110	78 78 69	123 103 95	73 72 95	118 118 104	65 72 55	95 77	99 101	113 101	120 101
20	VINIICIUS AT 71 8836 674 VASARI Pp* / HILFINGER	2021 Eu, A3, 27 J		138 72 -1	122 82 -1	104 69 -4	127 76 +2	133 79 0	+986 +30 100	-0,12 +30	-0,05 100	112 100 100	70 69 67	124 101 97	65 73 69	118 102 113	78 78 69	113 110 107	73 71 80	116 110 95	64 64 55	111 77	103 100	111 100	119 100

New bulls are orange-coloured

Toplist by Total Merit Index – Genomic young bulls

Rg	Identification data			Partial breeding values					Milk			Beef	Fitness					Conformation		
	Name ID Sire / Dam's sire Genet. def.	YoB, Foreign AI Center Availability	TMI	MI Re	BI Re	FIT Re	TOI Re	Mkg	F% Fkg	P% Pkg	NDG CARC TRC	Long Pers Perf	UdH CLV p VIT	SCC CLV m Msp	FEI Bef MiBe	FR Re	MU	FL	UD Add	
21	GS WUNDERINO AT 09 7146 569 WEISSENSEE / REUMUT	2019 A1 J	138	121	113	126	133	+610	+0,13	+0,02	107 78	116 72	124 84	123 80	119 73	101 83	104	95	111 97	
22	GS WHAKAN AT 50 5975 374 GS WUHUDLER / POSSMANN	2021 A1 J	137	125	105	122	132	+1147	-0,20	-0,02	108 72	126 66	121 78	118 73	106 65	110 77	113	101	112 102	
23	GS DEFAC TO AT 95 3502 538 GS DER BESTE / MINT F5C	2018 A1 J	137	123	117	114	134	+964	-0,06	-0,05	124 98	115 75	111 85	107 81	108 76	113 84	97	110	126 102	
24	GS RAZFAZ AT 09 5456 669 ROLLS / ETOSCHA F2C	2019 A1 J	137	122	115	118	135	+958	-0,02	-0,08	115 78	114 72	121 83	119 79	101 72	90 83	111	103	110 103	
25	MERLE AT 11 1010 774 MCGYVER / VESUV	2021 Eu, A3 J	137	121	102	126	135	+700	-0,03	+0,09	98 72	126 66	116 79	111 74	113 66	93 78	96	110	119 100	
26	GS WEGA Pp* AT 23 7794 869 WEISSENSEE / MAHANGO Pp*	2019 A1, 17, 2 J, J, V	137	120	106	126	131	+1040	-0,17	-0,10	105 80	120 71	115 83	114 78	117 72	107 82	104	96	110 104	
*27	GS EL TORO AT 87 0121 274 ERASMUS / HUSAM	2021 A1 J	137	119	108	125	137	+986	-0,15	-0,10	108 72	127 66	116 79	113 73	113 66	110 78	98	109	127 107	
28	ZACHARIUS AT 87 8232 668 GS ZICKZACK / REUMUT	2018 Eu, A3 J	136	133	110	109	129	+862	+0,31	+0,02	106 76	104 68	106 82	107 78	109 69	104 81	94	101	105 100	
29	HALBMOND Pp* AT 48 5997 674 HAMLET Pp* / DIAMANT	2021 17, A1 J	136	133	100	110	128	+1374	-0,05	-0,07	101 70	122 66	104 79	102 73	97 66	99 78	82	100	112 101	
30	GS ZAPATO AT 43 5238 174 ZUBRINGER / IMPERATIV	2020 A1 J	136	130	105	116	129	+1132	-0,03	+0,01	102 73	111 66	110 79	114 74	111 66	99 78	100	102	108 102	
31	HERZPOWER AT 49 7395 374 HERZKLOPFEN / STURMWIND	2021 Eu, A5, A3, 6, 27 J	136	128	112	113	134	+850	+0,10	+0,05	111 76	115 66	113 78	110 73	100 65	110 77	107	112	132 102	
32	GS HOERI AT 19 6383 369 HOKUSPOKUS / RUKSI	2019, 4 % RF A1, 17, 2 J, J, V	136	128	105	118	132	+664	+0,27	+0,08	101 79	113 68	107 81	103 77	117 69	102 79	93	115	122 99	
33	GS WHITESTAR AT 96 7500 169 GS WOIWODE / HARIBO TPC	2019 A1 J	136	127	100	122	138	+1277	-0,17	-0,08	91 77	121 69	117 82	118 78	106 70	109 82	100	111	118 105	
34	WESTEN AT 85 7220 869 GS WOIWODE / WABAN	2020, 5 % RF Eu, A3, 6 J	136	125	93	128	131	+1100	-0,12	-0,04	87 75	120 67	115 81	114 77	123 68	94 81	93	104	112 104	
35	GS MYDREAM AT 84 9695 769 GS MYDARLING / GS DER BESTE	2020 A1 J	136	124	99	123	135	+1320	-0,23	-0,14	93 78	129 67	108 80	104 75	115 67	103 79	93	110	121 101	
36	SPARTA P*S AT 52 7793 974 SPARTACUS / INCREDIBLE PP*	2021 Eu, A3 J	136	123	112	120	131	+1056	-0,10	-0,08	107 73	116 66	105 79	108 74	117 66	104 77	100	99	107 101	
37	SUPERBOY AT 46 2742 874 SPARTACUS / ZAZU	2020 Eu, A3, 6, 27, A5 J	136	123	107	123	136	+628	+0,11	+0,07	107 73	127 66	117 78	117 73	110 65	115 77	101	120	119 99	
38	GS WABANGO AT 88 5925 968 WABAN / MAHANGO Pp*	2018 A1 J	136	123	99	124	128	+944	-0,10	0,00	102 86	116 74	120 84	120 80	115 74	109 84	105	95	101 101	
39	GS WAMBLEE AT 50 5532 674 WUESTENSOHN / GS WOHLTAT	2020, 7 % RF A1 J	136	120	112	124	134	+835	-0,16	+0,06	105 74	119 67	122 79	117 74	114 67	103 78	109	104	113 103	
40	GS WOWARD AT 82 4640 769 WODONGA / RALDI	2020, 7 % RF A1, 2, 17 J, V, J	135	126	83	128	136	+758	+0,18	+0,01	90 79	124 69	124 82	118 78	113 69	113 82	101	110	118 102	
41	WUESTENSOHN DE 09 53631006 WORLD CUP / RALDI	2018, 10 % RF 17, 17, 2, A1 E	135	124	110	117	131	+1116	-0,19	-0,03	108 96	113 76	120 85	116 80	110 77	104 83	122	101	111 111	

New bulls are orange-coloured

Toplist by Total Merit Index – Genomic young bulls

Rg	Identification data			Partial breeding values					Milk			Beef		Fitness					Conformation						
	Name ID	YoB, Foreign		TMI	MI	BI	FIT	TOI	Mkg	F%	P%	NDG	Long	UdH	SCC	FEI	FR	MU	FL	UD					
	Sire / Dam's sire Genet. def.	AI Center Availability		Re	Re	Re	Re	Re	Fkg	Fkg	Pkg	CARC	Pers	CLV p	CLV m	Bef	Re			Add					
42	GS WALDSTAR AT 50 5119 869 WEISSENSEE / MAHANGO Pp*	2019 A1 J		135 77 +1	124 86 +1	102 75 0	120 81 +1	129 83 +1	+1189	-0,20 +31	-0,08 +35	102 100 103	76 75 73	122 115 103	70 79 72	116 99 104	83 87 72	114 105 110	79 76 85	104 -17% 101	71 65	97 83	105 100	102 100	108 100
*43	HERMO AT 72 0709 574 HAPPYNESS / ZEPTER	2021 Eu, A3, 6 J		135 72 new	124 82 new	101 72 new	119 77 new	132 79 new	+957	-0,02 +38	-0,05 +30	108 98 100	73 72 70	116 105 108	66 74 70	116 108 119	79 80 69	118 104 101	74 71 81	110 65	65	106 78	98 104	106 104	112 104
44	HALOX AT 71 5690 474 HAMLET Pp / HARIBO	2021 Eu, A3 J		135 74 new	124 83 new	101 72 new	119 79 new	136 81 new	+701	+0,15 +43	+0,01 +26	100 102 100	72 72 70	124 110 111	68 74 71	121 115 114	80 80 72	115 106 112	75 74 82	95 74	68	103 80	98 99	117 117	117 99
45	MUSIKANT AT 02 1437 374 MANAUS / HURLY	2020 Eu, A8, 6 J		135 74 -3	123 83 -1	112 73 -4	119 78 +1	130 80 -1	+1109	-0,10 +37	-0,12 +28	109 109 107	74 74 73	112 106 105	67 75 69	106 101 119	79 79 70	106 104 101	74 73 81	114 66	66	98 79	111 101	111 101	99 101
46	MEDIAN AT 20 1692 574 GS MYSTERIUM Pp* / VILLEROY	2020, 5% RF Eu, A3, 6, 27 J		135 75 -3	122 84 -5	116 74 +1	111 79 -2	133 81 -2	+1244	-0,26 +28	-0,10 +34	116 112 111	75 74 73	123 99 106	68 77 72	117 105 111	81 79 71	119 102 113	76 74	87 68	68	103 80	103 106	117 106	119 106
47	GS ZENOS AT 68 2150 874 ZEIGER / IMPERATIV	2021 A1 J		135 73 0	122 83 +1	111 72 -6	122 78 +3	127 80 -1	+738	-0,01 +30	+0,05 +31	111 110 105	73 72 69	109 95 106	67 74 71	118 90 98	79 81 71	115 111 105	74 74	125 67	67	105 79	101 105	98 110	110 105
48	HOFSEIGER AT 46 7719 174 HOFMEISTER / SISYPHUS	2021 Eu, A3 J		135 72 -1	120 82 0	102 70 -5	128 77 +2	132 79 -1	+621	+0,07 +32	+0,04 +25	97 105 101	71 73 68	122 108 102	66 73 69	109 104 104	78 79 70	109 106 115	73 72	129 65	65	97 77	102 102	106 102	112 102
*49	GS EASYBOY AT 01 9900 788 EASY / VARTA	2021 A1 J		135 72 new	119 82 new	110 70 new	128 77 new	133 79 new	+584	+0,06 +30	+0,03 +23	109 105 109	71 70 68	111 117 110	66 74 70	124 102 104	79 78 69	122 109 93	74 72	121 65	65	110 78	98 102	97 115	115 102
50	GS HELLSTORM AT 57 1984 669 HELSINKI / GS DER BESTE	2020 A1 J		135 76 -2	119 85 -2	104 75 -4	125 80 0	135 82 -2	+1096	-0,16 +31	-0,15 +25	90 111 102	76 75 74	122 112 102	68 78 73	116 117 112	81 89 72	116 108 113	77 75 84	113 +6%	69	98 81	104 104	114 104	116 104
51	MOAB AT 23 7166 769 MINOR / HURLYS	2019 Eu, A3, 6 J		135 76 -3	118 86 -2	91 75 -4	134 79 -1	133 82 -4	+809	-0,13 +22	-0,02 +27	92 95 94	76 73 72	134 108 100	68 78 75	117 106 112	81 80 68	114 101 73	77 73	123 68	68	90 80	95 108	108 103	122 103
52	ERICH AT 20 4292 774 EDELSTEIN / VESUV	2020 Eu, A3 J		135 75 +2	112 85 -1	112 74 0	132 79 +4	137 81 +3	+330	+0,02 +16	+0,06 +17	103 120 103	75 74 73	124 111 103	67 78 72	120 101 102	81 80 70	120 112 98	77 74	125 68	68	99 81	104 107	120 107	119 107
53	GS HERCULEO AT 50 5973 174 HERZKLOPFEN / HUMPHREY	2020 A1 J		134 73 -4	136 83 -1	108 74 -4	103 78 -2	123 80 -4	+1536	-0,12 +53	-0,07 +48	110 100 111	75 74 73	101 101 103	67 74 71	97 102 104	79 79 70	97 107 111	74 73	105 66	66	109 79	99 103	97 106	106 103
54	MAZDA Pp* AT 55 2476 774 MERCEDES Pp* / EVERGREEN	2021 Eu, A3 J		134 74 0	132 83 0	98 75 -2	111 79 +2	123 81 0	+1226	-0,07 +45	0,00 +44	106 91 102	75 75 73	116 101 102	68 75 72	119 106 111	80 81 72	119 103 102	75 75	91 68	68	101 79	101 105	105 114	114 105
55	GS WUHDLER AT 26 7174 169 WABAN / MANIGO	2018 A1, 2, 17 J, V, V		134 80 0	125 86 +1	102 86 -1	118 84 -1	132 86 -1	+1147	-0,17 +32	-0,03 +38	96 100 105	88 85 84	125 122 117	75 79 77	119 97 97	84 99 94	121 101 104	79 87 84	98 +1%	75	107 82	107 103	111 108	108 103
*56	SIDIK AT 71 7236 774 SIDO / MOGUL	2021 Eu, A3, A5, A8 J		134 73 new	124 82 new	108 70 new	116 77 new	132 80 new	+1013	-0,05 +37	-0,07 +30	109 111 101	72 70 69	116 102 114	66 74 70	115 106 99	79 79 70	114 102 118	74 73	108 65	65	104 78	100 100	109 114	114 100
57	WEISSENBACH AT 13 7240 274 GS WOIWODE / GS WRIGLEY	2020, 6% RF Eu, A8, A3, 6 J		134 75 -1	124 85 0	108 74 -2	116 79 0	130 81 0	+770	+0,08 +39	+0,02 +29	101 109 107	75 74 73	116 110 104	67 78 71	107 104 105	81 82 70	107 77	77 68	68	100 81	95 103	103 111	111 101	
58	GS HELOS AT 47 5836 974 HERAKLES P*S / HORIZONT	2020 A1 J		134 73 +1	124 82 +1	97 72 -4	123 78 +1	131 80 +1	+723	+0,03 +33	+0,10 +35	101 92 102	73 73 71	118 102 104	66 74 69	117 99 106	79 79 70	113 111	74 73	115 66	66	103 78	101 102	106 102	122 102
59	GS ZAUNKOENI AT 44 1957 474 ZEIGER / GS HIPSTER	2021 A1 J		134 73 -1	123 82 +2	96 78 -8	123 80 +1	132 80 -1	+1098	-0,12 +35	-0,11 +29	105 93 96	73 71 69	120 112 109	66 74 69	118 96 97	79 80 70	120 113	74 73	112 66	66	111 79	104 106	106 115	115 104
60	GS SPOTIFY AT 67 9659 874 SPARTACUS / GS DER BESTE	2021 A1 J		134 73 -3	123 82 -1	93 73 -5	124 77 0	135 79 -3	+788	+0,03 +36	+0,02 +30	92 98 92	76 73 71	121 104 108	66 73 69	112 105 121	78 80 70	109 108	73 73	112 66	66	116 77	104 104	107 129	129 104
61	HORAZIO P*S AT 22 6832 169 HILFINGER / MAHANGO Pp*	2019 Eu, A3, 6, A5, 27 J		134 78 -1	122 86 0	105 76 -2	120 82 0	127 84 -2	+632	+0,14 +38	+0,03 +25	110 106 98	77 76 74	115 111 95	71 79 75	115 113 107	83 99 90	110 109 101	79 82 85	110 +2%	72	118 82	96 98	100 117	117 98
62	VILIUS AT 26 4007 968 VILLEROY / EVERGREEN	2018 Eu, A3 J		134 79 +3	121 86 0	125 92 +6	109 82 0	127 85 +2	+771	-0,02 +30	+0,03 +30	115 128 115	93 93 91	113 95 96	73 78 76	97 99 108	83 95 82	98 111 85	79 77 90	108 +2%	72	91 82	101 108	107 106	106 108

New bulls are orange-coloured

GS WIN AGAIN



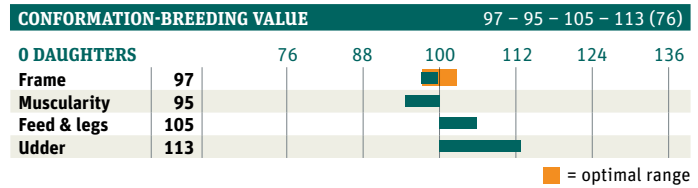
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AT 63 5520 774
GENOSTAR; CRV; Greifenberg

Breeder: Johann & Sonja Wagner
8800 Unzmarkt

Breeding Value: gTMI 151 (70) | BI 112 (67) | FIT 114 (75) | TOI 148 (77)
MI 141 (81) +1,925 -0.27 +54 -0.08 +61

DESCENT		
WONDERBOY AT 27 8285 869 Index: 131 / 123 / +1,787 -0.14 -0.15	WILKINS DE 09 52479484	GS WATTKING
WKS LEONIE AT 87 5029 368 Index: 131 / 121 / +1217 -0.35 -0.04 200 d. 5,750-3.61-3.61-415	BEANIE AT 91 9344 229	HERZSCHLAG
	WORLDCUP DE 09 51373137	GS WERTVOLL
	LAUSI AT 02 2246 829 5/4 - 11,421-3.73-3.58-835	REMEL



WIRBELWIND P*S



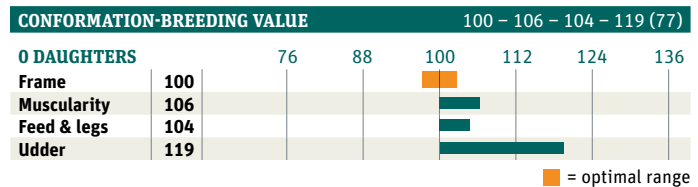
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AT 73 6267 574
EUROgenetik; OÖ Besamungsstation;
RZT; caRI; RBW

Breeder: Roman Dietrich
4974 Ort i. Innkreis

Breeding Value: gTMI 144 (72) | BI 103 (70) | FIT 130 (77) | TOI 139 (79)
MI 128 (81) +1,213 -0.12 +39 -0.06 +38

DESCENT		
WAALKES Pp* AT 81 8534 568 Index: 135 / 130 / +1,189 -0.07 +0.00	WABAN AT 80 6062 819	WILLE
WAIANA AT 69 3499 668 Index: 132 / 115 / +587 -0.02 -0.02 2/1 - 7,693-4.40-3.47-605 HL: 1. - 7,693-4.40-3.47-605	PIGAS PP* DE 09 51115883	VOLLGAS P*S
	SISYPHUS DE 06 66439378	SYMPOSIUM
	WALLI AT 87 2678 722 6/5 - 8,916-3.59-3.54-635	WALOT



GS SPUTNIK



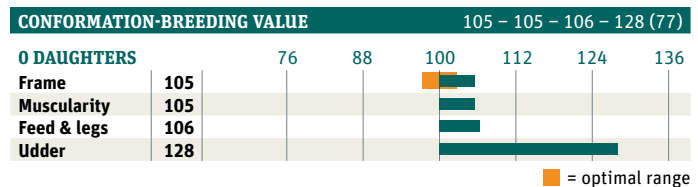
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AT 65 3730 974
GENOSTAR; CRV; Greifenberg

Breeder: Theresia & Josef Zeller
3170 Hainfeld

Breeding Value: gTMI 142 (72) | BI 115 (72) | FIT 125 (77) | TOI 138 (79)
MI 125 (82) +882 +0.00 +37 +0.01 +32

DESCENT		
SPARTACUS AT 80 4610 768 Index: 131 / 116 / +798 -0.11 -0.08	SEHRGUT DE 09 47357352	SERANO
SUSI AT 24 1159 568 Index: 134 / 132 / +933 +0.18 +0.05 3/2 - 10,240-4.50-3.64-833 HL: 2. - 10,648-4.72-3.75-902	KRONE AT 88 3244 329	HERZSCHLAG
	VARTA DE 09 50350294	VALEUR
	SCHNEEWITZ AT 17 1146 228 7/6 - 10,287-4.13-3.00-733	RUKSI



GS WUNDAWUZI



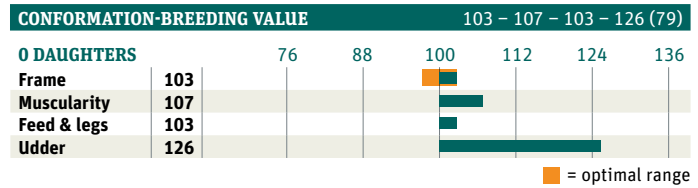
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AT 19 5270 174
GENOSTAR; CRV

Breeder: Robert & Bernhard Perzi
3822 Karlstein an der Thaya

Breeding Value: gTMI 142 (73) | BI 103 (76) | FIT 130 (78) | TOI 143 (80)
MI 125 (83) +1,101 -0.12 +35 -0.03 +36

DESCENT		
WESTWIND DE 09 54382865 Index: 132 / 121 / +783 -0.01 +0.01	WORLD CUP DE 09 51373137	GS WERTVOLL
	GERMANY DE 09 51373134	EPINAL
LIA AT 25 0569 168 Index: 131 / 117 / +973 -0.27 -0.05 2/2 - 9,500-3.82-3.60-705 HL: 2. - 10,211-3.76-3.57-749	GS DER BESTE AT 51 4740 229	DAX
	LINETT AT 11 4014 228 6/6 - 10,878-3.60-3.11-730	WOBBLER



SUPERBOY



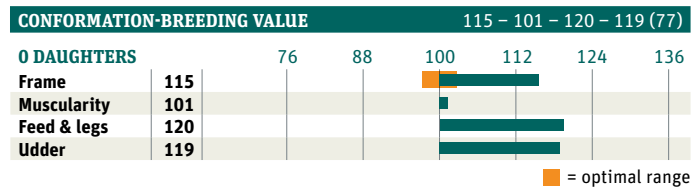
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AT 46 2742 874
EUROgenetik; OÖ Besamungsstation;
RZT; N./A.; RBW

Breeder: Grenzlandmilchhof
GmbH & Co.K, 4162 Julbach

Breeding Value: gTMI 136 (72) | BI 107 (72) | FIT 123 (77) | TOI 136 (79)
MI 123 (82) +628 +0.11 +36 +0.07 +28

DESCENT		
SPARTACUS AT 80 4610 768 Index: 131 / 116 / +798 -0.11 -0.08	SEHRGUT DE 09 47357352	SERANO
	KRONE AT 88 3244 329	HERZSCHLAG
SABRINA AT 78 8296 368 Index: 131 / 121 / +620 +0.08 +0.05 2/1 - 8,297-4.66-3.76-698 HL: 1. - 8,297-4.66-3.76-698	ZAZU AT 26 5588 938	ZEPTER
	SUSI AT 16 9842 438 4/3 - 10,179-4.38-3.54-806	VAENOMENAL



HAMLET Pp*



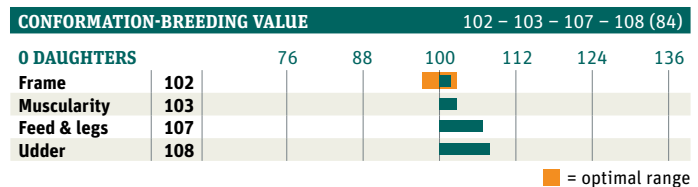
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AT 14 7665 169
EUROgenetik; OÖ Besamungsstation;
RZT; N./A.; RBW

Breeder: Heidemarie & Martin Günzinger,
4983 Sankt Georgen
bei Obernberg

Breeding Value: gTMI 132 (81) | BI 107 (81) | FIT 114 (86) | TOI 125 (87)
MI 123 (87) +1,018 -0.05 +38 -0.08 +29

DESCENT		
HERMELIN DE 09 51697464 Index: 119 / 122 / +747 +0.15 -0.05	HERZSCHLAG AT 30 3304 428	HUTERA
	RODICA DE 09 46187255	GS RAVE
ARIELLE Pp* AT 55 3115 738 Index: 130 / 124 / +1,221 -0.16 -0.11 2/2 - 12,237-4.05-3.31-901 HL: 2. - 12,536-4.06-3.35-929	MAHANGO Pp* DE 09 48097266	MUNGO Pp
	ARIANE Pp* AT 09 6493 529 5/4 - 11,392-3.84-3.54-840	INCREDIBLE Pp*





Legend of the toplist

IDENTITY DATA

Rg	Rank sorted according to TMI, MI, BI, FIT (all descending)
Name	Name
ID	Identification's number
Sire / Dam's sire	Sire / Dam's sire
YoB	Year of birth
Foreign	Breed with any foreign gene share
Genetic def.	Genetic defects with 3 digit code:
Digit 1-2	Abbreviations for genetic defects (B2 – Brown Swiss haplotype 2, F2 – Growth defect/Short stature, F5 – Fleckvieh haplotype 5, TP – Thrombopathy)
Digit 3	„C“ for „heterozygous carrier“ (Carrier), „S“ for „homozygous carrier“ (Sure)
AI Center	Insemination centre, which are in the (co-) owning of the bull: A1 = GENOSTAR A3 = Hohenzell, OÖ A5 = Samendepotstelle Rotholz, Tirol A7 = Klessheim, Salzburg A8 = Perkohof, Kärnten A9 = Samenvertretung Vorarlberg AV = Vöcklabruck, OÖ Eu = EUROgenetik 2 = Greifenberg 3 = Höchstädt 6 = Neustadt a. d. Aisch 7 = Memmingen 9 = Marktredwitz-Wölsau 10 = Bayern-Genetik 16 = Bauer, Wasserburg 17 = CRV Meggle 26 = ZBH Alsfeld 27 = RBW C1 = CRV (CZ) C2 = Jihočesky chovatel (CZ) C3 = Plemko (CZ) C4 = Plemo (CZ) C5 = CHD Impuls (CZ) C6 = Reprogen (CZ) C7 = Natural (CZ)

Availability

Availability of semen in relation to the owning stations (J=yes, E=restricted; V=available, but currently no distribution, N=no), if the availability is the same for all stations, it will be expressed only once, otherwise, in the appropriate order

PARTIAL BREEDING VALUES

TMI	Total merit index
MI	Milk index
BI	Beef index
FIT	Fitness index
TOI	Total organic index
Re	Reliability
Diff	Difference to the last breeding value estimation

MILK/CONFORMATION

Mkg, F%, P%, Fkg, Pkg	Breeding values for milk yield, fat and protein content, fat and protein yield
Ext-Dau	Number of described daughters
FR-MU-FL-UD-(Add)	Breeding values for frame, muscularity, feet&legs, udder, udder cleanness

BEEF

CCI	Breeding value for commercial cross
NDG	Breeding value for net daily gain
CARC	Breeding value for carcass percentage
TRC	Breeding value for EUROP trade class

FITNESS

Long	Breeding value for longevity
Pers	Breeding value for persistency
Perf	Breeding value for performance increase

MSp

Breeding value for milking speed (average kg/min)

UDH FEI CLV p/m

Breeding value for udder health
Breeding value for fertility
Breeding value for direct and maternal calving ease

VIT

Breeding value for calf vitality

SCC

Breeding value for somatic cell count

Fert

Breeding value for fertility in %

MiBe

Breeding value for milking behavior

Mas

Breeding value for mastitis

EFD

Breeding value for early fertility disorders

Cyst

Breeding value for ovarian cysts

MiFe

Breeding value for milk fever

ABSOLUTE PERFORMANCES INDICATORS

Int-Dau

Number of daughters in international milk breeding value estimation

Farm

Numbers of farms, where the daughters are being bred

in 1.L, in 2.L, in 3.L

Number of daughters in the milk evaluation in the 1st, 2nd and 3rd lactation

MP 1, MP 2, MP 3

Average number of test days of daughters in the 1st, 2nd and 3rd lactation

D100, D1, D2, D3

Number of daughters with completed 100-day performance, 1st, 2nd and 3rd lactation

Mkg, F%, P%, F+P

Average milk yield, fat and protein content, fat and protein yield of the daughters

ØHd

Herd average in which the daughters are kept

Mat.

Mating level expressed as MI average of daughter's dams

Sustainable Agriculture – the Austrian Way



The AAC Austrian Agricultural Cluster is the association of the major Austrian producers of agricultural and food processing technologies as well as breeding organisations.

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- Technology for the production of healthy, nutritional, high-quality foodstuffs with less environmental and climate footprint
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Sebastian Auernig, AAC-Chairman



Contact us for collaboration and project development:

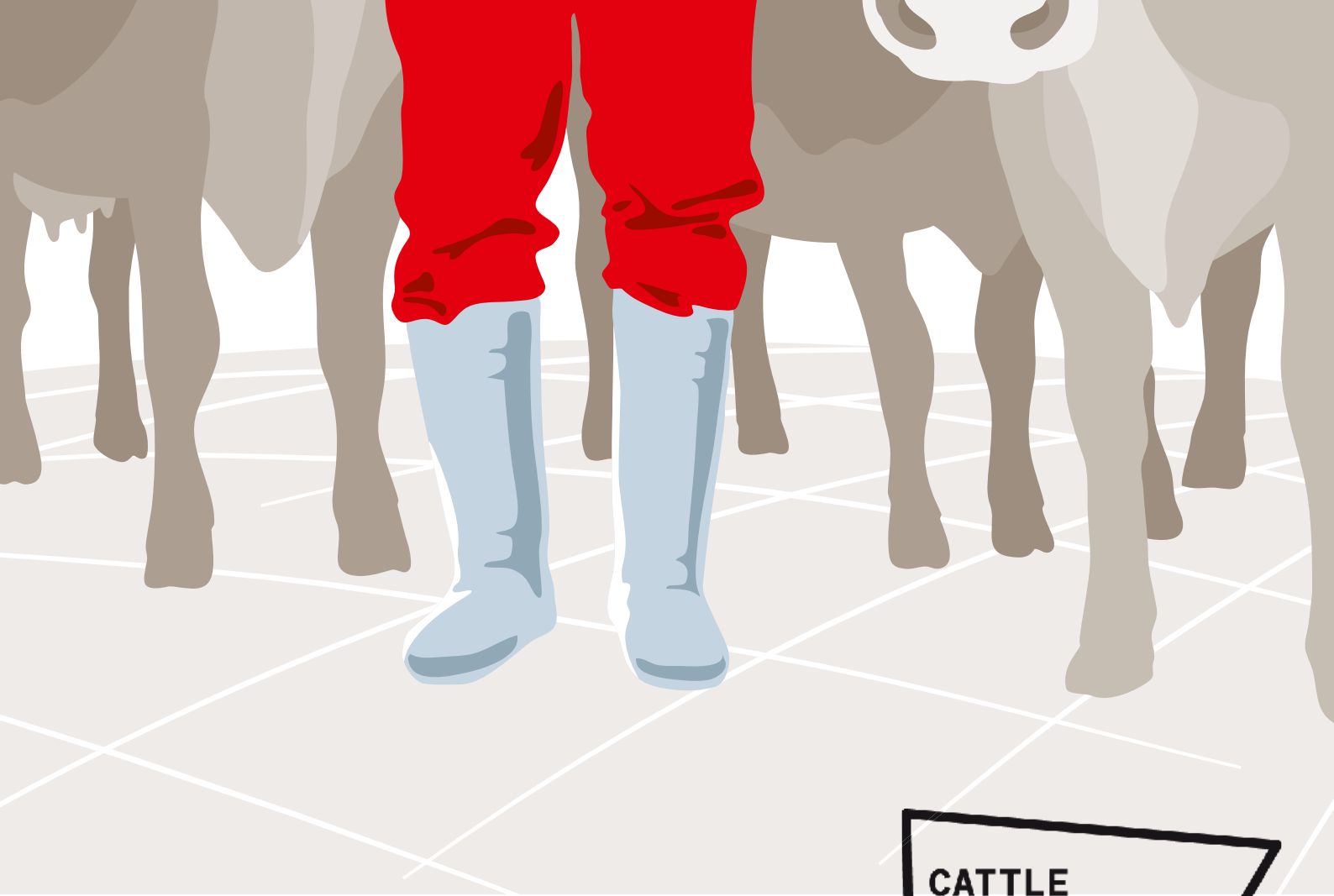
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FREISTADT

09.03.-04.

Saturday, Sept. 03.

RZO-Rinderkompetenzzentrum

- FleckScore-Worldcup
- Offspring Show
- Young Breeders competition
- Elite Auction

Sunday, Sept. 04.

RZO-Rinderkompetenzzentrum

- Judging of cow groups
- National Championship
- Raffle
- Beef Festival

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guest in Austria!

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SIMMENTAL
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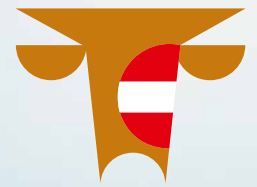
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
Fleckvieh changes
the world of cattle!



FLECKVIEH
A U S T R I A



Fleckvieh enables efficient dairy farming with cows that are robust and adaptable. As such, Fleckvieh is the perfect match for the latest requirements in terms of animal welfare and climate impact. Fleckvieh is suitable for dual-purpose use and offers a unique combination of fertility, udder health, and resilience. Fleckvieh is able to produce milk **and** meat of the highest quality using purebred females **and** males. Fleckvieh is thus scientifically proven to be the breed of the future in terms of both economics and ecology.

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