

Supplementary Information

Table S1. Landraces, varieties, pre-breeds and breeds absorbed into current breeds (Felius, 1995; Porter 2002). Names in local language, if not English, are in italics. Bold indicate current breeds resulting from amalgamations; small printing indicate varieties of a landrace, pre-breed or former breed. Years underlined indicate the establishment of a herd book with for a few breeds also the ending; HB, herd book established but year unknown; BS, breed society with year of establishment if known; BP, protective breed program with year of establishment if known. Populations listed in the first two columns have been absorbed in the current breed (in bold), populations in the fourth column have been absorbed after the current breed was established. Names on the same line indicate continuation of a population under a different name. “×breed X” indicates incrossing of breed X; “breed Y × breed X” indicates upgrading or incrossing of breed X by breed Y; +breed Y indicates influence of breed Y.

Landrace, variety	Pre-breed, former breed	Current breed	Absorbed variety	Remark
Subgroup 1A				
Westland Polled				
Lyngdal	South and Westland (<u>1947</u>)	Westland Red Polled		1968 into NRF , 1980s restarted
Blacksided Trondheim				
Northland		Blacksided Trondheim and Northland (<u>1943</u>)		close to Fjällras
			Roros	crossbred cattle
		Swedish Mountain (Fjällras) (<u>1892</u>)		
			Herjeadals	
			Rorbottenland	
Estonian land cattle		Estonian Native (<u>1914</u>)		West Finn and Jersey influence
		Petsjora		now Kholmogory variety
			Komi	
Subgroup 1B				
		Telemark (<u>1926</u>)		Ayrshire and NRF influence
			Valdres	
			Hallingdal	
Gudbrandsdal				
Osterdal		Doela (<u>1909</u>)		1963 into NRF , 1970s restarted
Hordaland				
Westland Grey Möre		Western Fjord (<u>1947</u>)		into NRF 1968, 1980s restarted

Coastal land cattle		dwarfed
Tronder		since 1890 × Ayrshire »
Red Trondheim (1951)		
Malselv		> Dutch Friesian, Ayrshire × Tronder »
Red Trondheim and Malselv (1960)		1860-1900 × Ayrshire, 1900s + Swedish Red-and-White, Dutch Friesian, Shorthorn, into pre-breeds »
Horned Lowland (1923)		
Hedmark		
Norwegian Red and White (1939)		pre-breeds amalgamated »
Norwegian Red (NRF) (1961)		more breeds joined, open synthetic population
Smaland		after 1850s × Shorthorn, Ayrshire, Dutch Friesian
Gotland		× Jersey, Shorthorn, Ayrshire
Oland		× Jersey, Shorthorn, Ayrshire
Herrgard		very mixed dairy cattle
Red Pied Swedish (1880),	then absorption of:	
Scanian		+ Dutch, German Red Pied
Sabyland		+ German Red Pied
Waldholm		+ Shorthorn
Frovidal		+ Shorthorn
Amasa		+ Shorthorn
Jonstrop		+ Ayrshire
Swedish Red-and-White (1928)		
Subgroup 1C		
Brae-Glen		small hill cattle
Aberdeenshire		+ Teeswater, Longhorn
Forfarshire		similar to Highland
Buchan Humlie		polled dairy-beef type
Angus Doddie		large, polled type
Aberdeen-Angus (1862)		1835 recognized; 1909 name official
Suffolk Dun		grey-brown dairy type
Norfolk Horned		red, dairy-beef type, Devon influence
Red Poll (1873)		
Longhorned Black cattle		
North Wales Black		work type
Anglesey		most important variety
Pembroke (South Wales Black)		dairy type
Castlemartin		
Dewslan		
Welsh Black (1874)		
Subgroup 2A		
Ballum	Red Danish Dairy 1970 (1885)	critical

Old Red Angeln (1885) Red North Schleswig		closely related to Red Danish strong influence on East European Red breeds
Estonian land cattle		× Angeln, Danish Red »
Estonian Red (1885)		
Local red		since 1880s × Angeln, Danish Red, Swedish »
Silesian Red (1893)		
Rawicka		
Wilna		polled, fawn variety
Lowland (Dolinowa)		red to fawn
Polish Red (1893)		absorbed Red Highland varieties
Red Colonist		imported German lowland red and red pied × Steppe; since 1850s × Brown Mountain, Zillertal, Red Tronder, East Friesian, Polish Red; 1917 varieties amalgamated
Odessa		
Taurien		
Crimean		
Kuban Red		
Red Ukrainian (1923)		1945 + Estonian Red
Red German		1814 Red Highland × Romanian Grey
Dobrogea Red		1927-40 × Angeln
Romanian Red		1950s × Danish Red
Bessarabian Grey		since 1814 × German Red Highland »
Bessarabian Red		1930s + Angeln, renamed »
Moldavian Red Steppe		1940s + Estonian Red »
Moldovian-Estonian Red		critical
Red Sadovo (BS 1914)		since 1885 Angeln, Simmental, Dutch Friesian composite » + Angeln
		since 1945 Danish Red, Red Steppe, Latvian Brown, Simmental, Kulska, Swiss Brown, Sofia Brown, Iskar composite »
Bulgarian Red Sadovo		1967 renamed »
Bulgarian Red		critical
Majdaner		× Angeln, Danish Red, German Red, Polish Red, Estonian Red, Latvian Brown
Goralen Mountain		× Polish Red,

		Bernese/Simmental »
Goryn		
	Belarus Red (1967)	critical
Perm (North Russian polled) Tscherdian		since late 19 th century × Danish Red, Angeln, 1930s × Red Steppe, Estonian Red, Latvian Brown »
	Suksun (1941)	rare
Veurne-Ambacht Cassel		+ Durham dairy type as French Casseloise
	West Flemish Red (1920)	critical
Casseloise Artésienne Namponnaise Saint Poloise Berguenarde		only type surviving WW I
Picarde Guisarde Bailleuloise Bournaisienne		Normande – Flamande intermediate
	Flamande originelle (1886)	+ Durham, Ayrshire
		only semen left
Subgroup 2B		
Latvian Dairy		
	Latvian Blue (BS 2005)	+ Lithuanian Ash Grey, Latvian Brown, Tyrol Grey; critical
Lithuanian Dairy		
	Lithuanian Ash Grey	critical
(Northwest Dutch) Lowland Groningen		
	Groningen Whiteheaded (1874)	
(Northwest Dutch) Lowland		
Friesian black pied and red pied (1897)		only since 1966 Friesian HB accepted black pied sires from other Dutch provinces
North-Holland black pied type Groningen black pied type		
	Black Pied Dutch Friesian (1874)	crossed into all Black Pied breeds listed below
(Northwest German) Lowland		
East Friesian:		
Pied East Friesian (1885)		black-, red- or blue-pied
Unicoloured Red-brown East Friesian (1885-1904)		
Jeverländ (1878)		
Wesermarsh (1880)		+ Shorthorn
Oldenburg-Wesermarsh (1880)		
Black Pied Holsteiner (1879)		

German Black Pied Lowland		amalgamated 1945
East German Black-Pied (Eastern Reserve)		
Black Pied Dairy		Jersey, British Friesian × (1970) German Black Pied + Fleckvieh, Red Highland
		critical or extinct
Belgian Black Pied		until 1966 2 varieties:
Polders Black Pied		
Hervé Black Pied		
Belgian Black Pied-Holstein (HB)		
Campine land cattle		+ Durham × MRY »
Red pied Campine		remains rebred, HB 2012
Eastern Red pied-Ardenne		× MRY »
Red pied Eastern Belgian		
Red pied Belgian (1919-2012)		× Holstein, Red Holstein, absorbed into
Belgian Red Pied-Holstein (HB)		
Zulawka (Polish Marsh)		× Dutch Friesian, German Black
Polish Whiteback	(not completely absorbed)	Pied Lowland
Polish Black-and-White Lowland (1878)		since heavy losses WW II replenished with Swedish, German, Dutch Black Pied + (limited) Holstein
Fribourg (1878)		Since 1960 × German Black Pied; later × Holstein
Swiss Holstein (HB)		
Dairy Hungarian Pied		Jersey × Hungarian Pied
Dairy Hungarian Brown		Jersey, Swiss Brown × H. Pied
Hungarofries		Jersey, Holstein × H. Pied
Hungarian Holstein-Friesian (HB)		
Local		× East Prussian Black Pied »
Menno-Fries		× European Black Pieds »
Belarus Black Pied (HB)		
Podolian steppe		× Oldenburg Black Pied »
Podolian Black Pied		× European Black Pieds
Ukrainian Black Pied (HB)		recent + Holstein
Great Russian land cattle		× Yaroslavl, Kholmogory, Schwyz, Bernese, since 1920s East Friesian »
Central Russian Black Pied (1940)		
Oka		since 1952 × East Friesian and/or Kholmogory-Simmental cross, Swiss Brown, Jersey »
	Oka Black Pied	absorbed
Ukrainian Whitebacked		and

Polesian Marsh		+ Groningen Whiteheaded
Whiteheaded Colonist (1925)		1945 renamed
Ukrainian Whiteheaded		+ G.W. up to 1973
Kholmogory (1927)		+ Dutch/German Friesian
		largely absorbed:
	Great Russian land cattle	
	Kargopolian	
	Ilmen	
	Dwina	
	Schenkursk	
	North Russian Polled	
	Murmansk	
	Olonets	
	Wijtegras	
	Vychegdo-Vym	
	Waldais	
	Lenfa	
	Syrjänen	
	Ssuchona	
	Rokschenga	
Great Russian land cattle		1870-83 × several exotics
	Yaroslavl (1924)	since 1917 purebred
Subgroup 2C		
Eiderstedt		heavy beef
Ditmarsh		pied beef/dairy
Wilstermarsh		dairy/beef
Krempermarsh		dairy
Breitenburg		
Tondern		related to Angeln
Bramstedt		heather land type
	Red Pied Schleswig-Holstein (1875)	+ Shorthorn
	Red Pied South Oldenburg (1880)	
Münster runts		also into early MRY
	Red Pied Westphalian (1892)	
Cleve		
	Red Pied Lower Rhineland (1878)	× Shorthorn; × Dutch Red Pied
	German Red Pied Dual Purpose	1892 pre-breeds collaborating
		× MRY
	Red Pied East Friesian (1878)	
Dender		+ Durham »
	East Flemish White-and-Red (1897)	after 1914 × MRY, Belgian Red
		Pied; rare
Silesian Red		× Allgäu, Bernese, Fribourg,
		Mürztal, Schwyz, Zillertal, East
		Friesian red pied »
	Silesian Whiteback / Kodzka (1910)	× German Red pied lowland ,
		MRY since 1945 »

Polish Red-and-White Lowland		× Holstein since 1970
Ardennaise, Famenne and Ciney (Hesbaye, Condroz)		1850-90 × Durham, 1890-95 × Friesian, 1890 + Charolais in 2 regional types »
Central and Upper Belgian (1919)		
Limon Blue	Belgian White-Blue (1973)	double-muscled beef
	Belgian White-Blue dual-purpose	since 1975 separate type
Ardennaise		
Bleue du Limon		same as Limon Blue 1919-1922 rebuilt with Belgian White Blue »
	Bleue du Nord (rameau mixte) (1923-1953)	1982 again recognized 1991 separate from beef type
Subgroup 2D		
Holderness		late 17 th century Dutch origin
Yorkshire		Dutch influence
Teeswater		early 18 th century Dutch and Holstein influence
Durham (improved Teeswater)		
Shorthorn (1822)	Beef Shorthorn Dairy Shorthorn (1959) Blended Red and White	Coates HB (first cattle HB) + Galloway, White Park separate from Beef Shorthorn; 1969 and later + Red Holstein, Holstein × Red Pied Friesian, Danish Red, MRY, Simmental
Simbirsk		Great Russian Land cattle breed × Friesian, Simmental, Shorthorn »
	Bestuzhev (1928)	1850 recorded, early 1900 × Wilstermarsch, Oldenburg
Subgroup 2E		
Yorkshire		
Lancashire		
Westmoreland		
Dishley Breed	Longhorn (1878)	
Subgroup 2F		
	Guernsey (1878)	
	Alderney	incorporated during WWII
Léonnaise		
	Froment du Léon (1907)	1939 largely absorbed by Armoricaïne; 1964 reconstructed with Guernsey
Pie Noire Morbihannaise		
	Bretonne Pie Noir (1885)	
Brune de Guingamp		probably ancestor of

Pie Rouge de Carhaix		Canadienne
Bretonne Rouge et Pie Rouge (1910)		+ Parthenaise, Nantaise
Léonnaise		
	Durham-Bretonne	since 1840 developed
	Armoricaïne	1962-70 together with
		Maine-Anjou as Rouge de l'Est,
		+ MRY, German Red Pied
		Lowland
Mancelle		Bernese /Fribourg/ Durham
		× Augeronne, Bretonne,
		Parthenaise
	Durham-Mancelle	1839-1860 Durham ×Mancelle
	Rouge des prés (1924)=	
	Maine-Anjou	former and international name
		1962-1970 together with
		Armoricaïne as Rouge de l'Est,
		+ MRY, German Red Pied
		Lowland
Mancelle		(See above)
Percheronne		transitional to Normande
	Saônoise (BS 1939, new BS 1997)	+ Maine-Anjou, Normande
Augeronne		around 1730 Dutch origin
Cotentine		× Augeronne, + Durham,
		Jersey; heavy and light types
Cauchoise		× Durham
	Normande (1883)	
	Brayonne	× Dutch; Cauchoise type
	Bessine	
	Solognote	
	Valognaise	Durham-Normande cross
	Merlerault	
	Mayennnaise	
	Beauceronne	
Subgroup 3A		
Bas-Rhin		separate small type until 1970s
Münster		
	Vosgienne (1918; 1955)	1947 no longer recognized
		1955 new HB
Subgroup 3B		
Odenwäld (1899)		
Waldeck (BS 1890)		short headed type
Hesse Red		still recognized as breed line
Sauerland (1894)		
Westphalian Red		still recognized as breed line
Vogelsberg (BS 1885)		still recognized as breed line
Taunus		

Harz Red (BS 1878)		still recognized as breed line
Branntager		
Vogtland Red (BS 1991)		reconstructed breed line
German Red Highland (BS 1911)		rebred with sires: 4 Yellow Franconian, some Czech Red
		1 Polish Red, 1 Tux-Zillertal, 1 Pinzgauer, 1 Salers, and 1 Braunvieh-Angler-Gelbvieh crossbred
		numbers increasing
Bohemian Red		small, triple-purpose
Cheb (Egerland)		close to German Vogtland
Moravian-Carpatian Red		whitebacked, mountain type
Lisna Red		
	Czech Red	critical
Subgroup 3C		
Tyrolese		popular first half 19 th century
Brixental		
Durtal		
Landl		
Tux		
Zillertal		
	Tux-Zillertal (1986)	since 1980 rebred with Hérens
Oka		1800-1870 × Zillertal
Gorbatov		Zillertal × Oka
Vladimir		Zillertal × Oka
	Gorbatov Red (1921)	Gorbatov-Vladimir amalgamate
		since 1990 + Angeln, Danish Red
Chuwash-Mari		1812-80× Zillertal, Gorbatov
	Yurino (1937)	1860-1908 + Swiss Brown, Simmental
Great Russian land cattle		× Zillertal, Devon, Bernese »
Pashkov		until 1924
	Tambov Red (BP 1989)	since 1980 + Danish Red
Jochberg		yellow and grey pied, polled
		× Pinzgauer
	Jochberger Hummel	polled Pinzgauer type
Rauris		in Rauris and Lower Pinzgau
Kitzbühl		in High Pinzgau
Mölltal (1925)		Pustertaler, Tyrolese × local
Pongau		from Sastein
Lungau		Pinzgauer × Mariahof, Ennstal
		Bergscheck
Tyrolese Pinzgauer		best developed, Salzburg
	Pinzgauer (HB)	varieties unified since 1870

Bergscheck		
Mölltal		
Drautal		× Tyrolese Pinzgauer
Red Pied Norica	Italian Pinzgauer (HB)	
Upper and Lower Bavarian land cattle		
Bishopric		work/beef type
Volmau		dairy/work type
New Miesbach		partly absorbed by German Fleckvieh
Berchtesgaden		
	German Pinzgauer (HB)	
Slovenian Busha		1869 × Mölltal, Pinzgauer
Goricka		
Bohinj Cika		
Tolmin Cika		
	Cika (1906)	vulnerable
Subgroup 3D		
Red Highland		since 1762 × Schwyz, Since 1773 + Friesian, Bernese, 1803-15 Charolais » 1890 fused with Donnersberg» 1906-14 + Yellow Franconian, 1953 into German Gelbvieh, 1950s + Angeln, 1961 remains into German Red; reconstructed since 1985
	Glan Glan-Donnersberg (1890)	
Hesse Red		× Schwyz, Bernese » 1960s × Glan-Donnersberg Yellow Franconian, Red Danish, non registered remnant
	Lahn	
Red Highland		
Swabian-Hall		
Lower Swabian		all bred to Allgäu, Bernese BS 1835, reconstructed
	Limpurger (1987)	
Old Franconian Red		varieties:
Hassberg		
Schweinfurt		
Röhn-Spessart		+ exotic sires, unspecified
Scheinfeld		× Heilbronn (3E)
Altmüh valley		× Schwyz, Allgäu (4D) »
Ellingen-Weissenburg		
Obermain valley		
Itsgründ		
Baunach		
Its and Baunachgrund		× Heilbronn
Ochshenfurt		× Heilbronn

Aischgrund	× Heilbronn
Schwälm	× Heilbronn
Mainland	× Heilbronn + Friesian
Yellow Franconian (1872)	since 1872
	+ Simmental, Devon,
	Shorthorn, Charolais
Mürztal	local shorthorn × Grey Steppe
Murboden	Mürztal × Mariahof
Murboden-Mürztal (BS 1898)	absorbed Mürztal, 1960s
	amalgamated with Austrian
Murboden	Yellow, remnant renamed:
	conservation herd 1986
Red Highland (of Lower Austria)	× Mariahof, Mürztal,
	Scheinfeld »
Gföhl-Zwetteln	
Red Highland (of Lower Austria)	× Gföhl-Zwetteln, Mürztal,
	Murboden, Montafon (4D),
	Allgäu (4D) »
Raabs	
Viennese landcattle	× Mariahof, Mürztal »
Stockeraur	
Waldviertel Blond (BP)	1933 amalgamation of
	varieties; since 1980s remnant
	rebred
Helmet	
Light Helmet	
Brown Helmet	
Helmer Blazed	
South Styrian-Carinthian land cattle	
Carinthian Blazed	
Mariahof	
Lavanttal	1890 amalgamated »
Mariahof-Lavental	1900 + Simmental
Carinthian Blond (BP 1988)	1950 with Waldviertel Blond
	into Austrian Blond , in 1951
	renamed Austrian Yellow ;
	remnant rebred
Subgroup 3E	
Bernese	
Berner Fleckvieh (1878)	
Simmental-Saanen	best developed valley type
Frütig-Adelboden	
Jura	
Illiez	
Lötsch	
Swiss Simmental	
Bernese (Alsace)	since 1872 named:

Montbéliarde (1890)		
	Comtoise	
	Tourache	partly absorbed
	Fémeline	partly absorbed
	Dauphinoise	partly absorbed
Jura		× Simmental since 1886 »
	Dauphinoise (BS 1912)	partly absorbed in Simmental f
Comtoise		
Tourache		× Bernese, Simmental
Haut Bugey		absorbed in Gesienne
Fémeline		most widespread variety
Bressane		× Bernese, with Aubrac, possible ancestor of Villard-de-Lans and Mézenc
Bresse		
Dombes		
Gesienne		Simmental × Bressane
Micahaille		
Simmental d'Alsace (1906)		Simmental × Bressane
Boucquemon		
Tachetée de l'Est (1929)		amalgamation of Bressane, Fémeline, Simmental pure 1940-50 Montbéliarde joined 1945 Gesienne 1947 Simmental d'Alsace. 1959 renamed Tachetée 1993 renamed Pie Rouge
	Pie Rouge de l'Est (1960)	
	Simmental française	
Friulana		red Podolian type from Venice
Carniella		
	Friulana pezzata rossa (BS 1831)	1880-1900 × Simmental cross
	Pezzata rossa Italiana (1957)	
Red and Pied Highland		× Bernese/Simmental:
Neckar-Heilbronn (Heillbronn)		
Messkircher		
Württemberg Spotted		» amalgamation
Alb		absorbed by Württemberg Spotted
Teck		absorbed by Württemberg Spotted
Bayreuth Spotted		Simmental × Vogtland
Rottal		
Bavarian land cattle		Pinzgauer, Simmental × local
Miesbach or Upper Bavarian Spotted		renamed
	German Fleckvieh (1892)	
Swabian land cattle		in Württemberg
Swabian-Hall Brown blazed		× Friesian, Bernese/Simmental
Red and Yellow Moor		
Tiger		
	Ansbach-Triesdorf (1897)	1940 extinct, reconstructed since 1987

Wels Spotted Mountain		
Inntal and Ennstal Spotted		× Pinzgauer, Austrian Blond, Bernese
/		
Innviertel Spotted		Simmental »
Bernese Spotted		Bernese × local spotted
Feldsberg		Bernese × Stockeraur
Immendorf		Fribourg, Bernese/Simmental × local
»		
Fleckvieh (1870)		
Danube Fleckvieh		
East Styrian Fleckvieh		
Innviertel Fleckvieh		
Tyrolese Fleckvieh		
Austrian Fleckvieh		4 regional varieties amalgamated in 1950
Sudeten Red		× Bernese/Simmental, Zillertal, Pinzgauer, Swiss Brown, Groningen Whiteheaded »
Kravarisky		
Moravian Red		× Bernese »
Berno-Hana		Bernese, Berno-Hana, Kravarisky × local red »
Hrbinecky		
Bohemian Wood		× Bernese »
Bohemian-Berne		
Czech Red Pied		1918 amalgamation of the 4 pre-breeds
Budweiser		
Stitary		
Sumava		
Manhartsberg		absorbed by Czech Red Pied established in 1918
Moravian Red Pied		× Bernese and Schwyz »
local red		
Opotchno		
Czech Fleckvieh		amalgamated Czech and Moravian Red Pied in 1969
Bonyhádi		× Fribourg, Bernese/Simmental »
Bonyhádi-Simmental Landrace		recognized until 1950s
Red Pied Landrace of Allföld		Bonyhádi, Simmental × Steppe
Magyartarka		1940s amalgamated with purebred Simmental »
Hungarian Pied (1896)		
Serbian Podolian		× Simmental »

Podolian Simmental		purebred and crossbred Simmental
Serbian Domestic Spotted		
Subgroup 3F		
Nivernais-Charolais (<u>1864</u>)		< 1880, Durham × Charolais
Charolais pure (<u>1882</u>)		
Charolais (<u>1919</u>)		
Nivernaise		related to Auvergne breeds
Morvandelle		related to Auvergne breeds, crossbred, prime work cattle
Bourbonnaise		Jurassic type, in part absorbed by Limousin
Subgroup 4A		
Limousin (<u>1886</u>)		
Poitevine		originally a Parthenaise variety
Marchoise		originally a Parthenaise variety
Berrichonne		Marchoise- Parthenaise cross
Brennouse		Marchoise-Parthenaise cross
Saintongeaise		related to Limousin
Angoumoise		almost identical to Limousin
Meyssac		Limousin variety
Meymac		Limousin × Maraîchine and Marchoise
Treignac		non-descript variety
Vendonnaise		non-descript variety
Auvergnate		
Bessarde		
Forézienne		
Mont Dor		
Limagne		
Ferrandaise (<u>1899</u>)		
Maraîchine		17th cent. × Schwyz »
Aubrac (<u>1892</u>)		1840-1880 +Durham, Highland, Devon, Swiss Brown
Gévaudan		Aubrac-Salers intermediate
Cévennes		
Anglès		close to Gasconne
Albigeoise		
Rouerge		
Causse		Salers influence
Ségala		
Salvagnac		Aubrac × Salers
Laguiole		
Mézens		partly absorbed
Subgroup 4B		
Montagne Noire		absorbed in Carolaise
Gasconne à muqueuses noires (1856)		type extinct 1970s

Carolaise (Ariège) (same HB)	became the main type
Roussillon	
Pays Sault	
Tarasconne	
Gasconne	

Aure

Barousse

Saint Giron

Casta (Aure et St. Giron) (1901)

> 1968 + Bazadaise

Garonnaise (1898)	> 1775 rebuilt with Limousin, Salers, Blonde des Pyrénées Charolais influence
Garonnaise de plaine	
Marmandaise	
Néracaise	
Quercy (1920)	Garonnais × Limousin
Périgourdin	possible Garonnais × Limousin
Garonnaise de côteau	Garonnais × Limousin
Aganaise	Garonnais × Limousin
Montalbanaise	Garonnais × Limousin
Blonde d'Aquitaine (1962)	
Blonde des Pyrénées	partially absorbed

Béarnaise

Barétous

Urt

Bas-Adour

Aspe

Ossau

Basquaise

Soule

Landaise

Pyrénées à muqueses roses (1901)

1951 renamed Blonde des
Pyrénées; 1987 renamed:**Béarnaise****Subgroup 4C**

Bionda Tortonese

Cabellota

Ottonese

Varzese

Montana rossa

amalgamated in 1994

Subgroup 4D

Bergamo

Rendena-Adige intermediate

Grigia di Val d'Adige

Grigia di Val d'Ultimo

Wels Tyrol

Meran

Vintschau

Passei

Grigia di Val di Fiemme Bellune Carnia		
	Grigia Alpina (Italian Grey Alpine) (1949) amalgamated in 1931	
Oberinntal Grey (1924)	Tyrol Grey	exchange of sires with Grigia Alpina
Schwyz (1775-82)	Swiss Brown (1878)	late 19 th century 4 main types:
	Schwyz	
	Appenzel	
	Toggenburg	
	Oberwalden	
	Glarus	8 other varieties
	Interlaken	
	Oberhasli	
	Uri	
	Bryenz	
	Feldis	
	Livin	
	Goms	
Allgäu		× Swiss Brown »
	Württemberg Brown (BS 1883)	
	German Original Brown	
Montafon		dark brown-Wallis type breed 1800-1850 strong Allgäu influence
Klostertal		Montafon variety
Paznaun		Montafon-Tuxer transitional type
Walsertal		Montafon-Allgäu transitional type
Thandberg		Montafon × Lechtal
Bregenz Grey-yellow		absorbed by Montafon and Allgäu
	Vorarlberg Grey-Brown Mountain (BS 1893) = Vorarlberg Brown	Schwyz × Montafon/Allgäu, 1923 new name
Lechtal (Grey Mountain)		x Montafon
Wipptal (Grey Mountain)		x Montafon
	Tyrol Grey-Brown Mountain = Tyrolese Brown (BS 1939)	including most Tux, Zillertal, new name
	Styrian Brown (BS 1922)	Schwyz × Allgäu, Oberinntal after 1945 amalgamated
	Austrian Original Brown	
Bryansker Forest, other landraces		× Swiss Brown, German Brown
	Russian Swiss	
		recent + Brown Swiss
Great Russian land cattle		
Miskov		Yaroslav, Kholmogor, Ayrshire × local
Babaev		Allgäu, Swiss Brown × local

Kostroma (1944)		recent + Brown Swiss
Subgroup 4E		
Romanian Mountain	Mocanitsa	critical
	Polim Busha	critical
	Imljani black	
Pester busha	Red Metohian	critical
Lika busha		× Tyrol Grey, Montafon »
	Dalmatian Grey (1945)	
Neretva busha		× Tyrol Grey »
	Gacko	
Carpathian Mountain		
Valachian Dwarf		
Mandans		
West Galizian-Carpathian		
Bukowina Mountain		
Podhalaner		× Allgäu, Montafon, Swiss Brown »
	Slovakian Carpathian Brown	
Werschowen		
Hutzul	Ukrainian Carpathian Brown (1973)+	Allgäu, Montafon, after 1980 Brown Swiss, Jersey
Subgroup 4F		
Chernigov		
Dnieper	Ukrainian Beef (1999)	multiple composite
Subgroup 5D		
Alistana		
Sanabresa	Alistana-Sanabresa (HB)	
Limiana		
Verinesa	Limíá (1990)	
	Mirandesa (1977)	
	Mirandez estremenho	
	Jarmelista	spotted dairy type
Subgroup 5E		
Avileña-Negra (1970)		
Negra Ibérica	Avileña Negra Ibérica (1980)	
Casta Cabrera		established 1775
Casta Carriquirris		
Casta Castellana		
Casta Espinosa y Zapata		established end 1800s

Casta de la Tierra
Casta de los Gallardo

founded 1750, Navarra Bulls ×
Andalusian cows

Casta Jijona

Ganado Bravo (1980)

contains many more castas

Subgroup 5F

Retinta andaluza (1933)

Colorada extremeña

Rubia andaluza

Subgroup 5G

Almanzoreña

Calasparreña

Lorquina

Murciana-Levantina

critical

Subgroup 6A

Camandona

partly absorbed in Italian
Bruna Alpina

Ossolane

grey mountain type

Susa

wheat to red, black eye blazes

Pinerlo

pearl grey lowland type

Canavese

landrace × Bernese

Piemontese ordinaria (1887-1891)

× Swiss Brown, + Charolais

Demonte

small mountain type

Racconigi

hill type

Carmagnola

plains type, Chianina influence

Piemontese (1958)

amalgamation of subtypes

Carpigiana

hill type

Modenese di pianura

lowland type

Modenese (1957)

endangered dairy-beef type

Perugiana

Valdarno

Val di Chiana

Chianina (1956)

largest valley type
1932 beef selection
programme

Romagnola di montagna

+ Maremmana, outcrossed by

Romagnola gentile

+ Chianina, Reggiana »

Romagnola (1956)

Collina delle Marche

hill type

Brina

intermediate type

Pianura delle Marche

lowland type

Marchigiana gentile

recognized in 1850,
1850-1900 × Chianina;
1900-1928 × Romagnola »

Marchigiana (1957)

Subgroup 6B

Grossetana

Romana

Maremmiana (1953)		+ Chianina, Romagnola, Marchigiana
Abruzzese		
Murgese		
Podolica Italiana (1931)		1930-40 + Swiss Brown, Romagnola, Maremmiana, 1940-50 + Chianina, Marchigiana
Labin (Blue cavallo)		blue-grey, fast work type
Istar-Karst		crossbred to Busha
Buje		possible descending Pugliese
Boskarin (Istrian) (1988)		> Podolica, Romagnola, + Marchigiana, Maremmiana
Siciliana piccolo		small Busha type
Modicana primitivo		intermediate type
Siciliana Grande		large Podolian type
		> rebuild + Chianina, Reggiana, Calabrese Podolica
Modicana (1952)		+ Danish Red
Subgroup 6C		
Hungarian Grey (1900)		1930/1970+ Maremmiana
Karst		
Moldavian		
Romanian Grey (1924)		1950 no longer in national breed programme, in 1980s remains gathered, BP 1989
Subgroup 7A		
East Anatolian Red		possibly absorbed varieties:
Çildir		possibly extinct
Göle		possibly extinct
Eleskirt		extinct
Khuzestan landrace		× Jersey, Red Sindhi »
Nejdi		
Armenian landrace		× Swiss Brown, Kostroma, Lebedin »,
Caucasian Brown		
Lori		> 1934-40 × Swiss Brown
Dagestan mountain		× Carpathian, Swiss Brown »
Dagestan Brown		1960 into Caucasian Brown
Azerbaijan Red		1930-60 × Swiss Brown, Kostroma, Lebedin »
Azerbaijan Brown		
Subgroup 7B		
Messaoria		lowland type
Paphos		hill type
Cyprus		critical or extinct

	Native Southern Yellow	critical
	Çukurova	
	Dört Yol	
	Karaisali	
	Siverek	
	South Anatolian Yellow-Red	
	Halep	
	Seferihisar	
	Lebanese	
	Beirut	improved Lebanese
Subgroup 8B		
Las Bela		from Baluchistan
	Red Sindhi (HB)	
	Gir (HB)	
	Vadhval	from E. Kathiawar
Subgroup 8C		
	Haryana	
	Hissar-Hansi	
Subgroup 8D		
	Kankrej (HB)	
	Gujarat	
	Vadhiyar	
	Nagar	
	Konkan	
	Malvi (BS)	
	Agar	
	Mandsur	
	Deccan	
	Kherigarh	
	Bhur	
	Dhaurahra	
	Manjra Singhai	
	Parehar	
	Kenkatha	
	Goranea	
	Bagondha	
	Patha	
Subgroup 8E		
Geonti		
	Krishna Valley	+ Ongole, Gir, Kankrej
Bettadapur		
Lingadahalli		outstanding pack bullocks
Hagalvadi		noted for spirit and endurance
Chitaldrug		noted for speed
Pavagada		
Midighesi		
	Hallikar	

Hagalvadi		Gujamavu	almost absorbed
Chitaldrug			original a Hallikar
Ajjumpur			part foundation Amritmahal
Molvally			noted for symetric horns
	Benne Chavadi		strongest type
	Amritmahal		18th century prime breed
		Swanta Gosu	Amritmahal × nadudana
	Alambadi		
		Masti dana	
		Nundi dana	
Subgroup 8F			
Dacca-Faridpur			West Bangladesh variety
Munshigani			same Bengal type
	Pabna		+ dairy zebu and
			West-European dairy breeds
Kerala dwarf zebus			× Brown Swiss, Jersey, Holstein
			since 1965 »
	Sunandini		recorded 1979
Subgroup 9A			
Zarizyner			
Don			
Kalmuck			
	Lower Volga		Kalmyk variety
Siberian			× East Friesian
Altay			× Black Pied
	Siberian Black Pied		since 1929 developed
Siberian		Kemerovo	multiple composite
West Siberian			× Shorthorn, Bestuzhev, Tagil,
			Red Steppe, Yaroslavl, Dutch,
			and Brown, since 1901 again
			Shorthorn
	Kurgan (1949)		multiple composite since 1890
Siberian White			
Buryat			
	Siberian Simmental		> Simmental × local
Transbaikalian			
Yakut (still existing)			
	Far Eastern Simmental		> Simmental × local
Kyrgyz (still existing)			× Dutch Friesian, Simmental
			Brown Swiss, Kostroma »
	Ala Tau (1950)		in Kyrgyzstan and Kazakhstan
		Ala-Almata	+ Ayrshire and Jersey
Subgroup 10A			
Wanniu			ancient Chinese
	Qinchuan		
		Zaosheng	1960-1980s absorbed

Pingchuan

miniature work type

Pinglu Mountain**Subgroup 10B**

Taiwan Yellow

Taiwan Zebu

since 1910 × Red Sindhi,
Kankrej »
not fixed, possible including
Taiwan Black

Subgroup 10C

Sumatra cattle

Sumatra Ongole

banteng origin, × Ongole »

Subgroup 11A

Oulmès Blond

Blond Zaërs

Blonde d'Oulmès et des Zaërs

small mountain type
large plateaus type
BP 1988

Beni-Ashene

Branes

Demnat

Fez-Meknès

Zemour

Moroccan Brune de l'Atlas

landrace

Aïn-Beïra

Chélif

Beni Sliman

Oran

Tiaret

Algerian Chaouia

identical to Moroccan

Algerian Guelma

endangered landrace

Biskra

miniature type

Tunisian Guelma

critical landrace

Kef

dairy type

Subgroup 11C**Somba**

taurine landrace

Pabli

red colored

Subgroup 12A

Oudalan

Azaouak

taurine

after 1900 outcrossed by zebu

Subgroup 12B**Adamawa Gudali**

Yola Gudali

zebu × Muturu

Subgroup 13A

Nuba Shorthorn

Nuba Mountain Zebu

taurine

outcrossed by zebu

Subgroup 13B**Garre**

Bimal

Singhi

Subgroup 13C

Masai Zebu		
Masai Grey		
Subgroup 13D		
Unguja Shorthorn		
Pemba Zebu		
Subgroup 14A		
Aradó		
Bileri		
Raya-Azebó		
Arusi-Galla		
Subgroup 14B		
Sesse Shorthorn		taurine
	Nganda	
Kigezi Shorthorn		taurine
Karagwe Shorthorn		taurine
	Kigezi	
Bantu cattle		taurine
	Bashi	
Ugoi sanga		Tanzanian, gigantic horns
	Sukuma	zebu × Ankole
Subgroup 14C		
Damara-Herero		remnants of Setswana cattle after late 19 th century plague replenished with other sangas
	Damara	
Govuvu		
Binga		
	Tonga	> Barotse × Setswana remains
Makalanga		Setswana breed
	Mashona (1954)	> Angoni × Makalanga remains
Matabele		mixed Setswana cattle, selected as beef breed since 1946,
	Nkone (BS 1967)	1961-69 called Mangoni
Ngwato		Setswana type
Amabowe		Setswana type
	Tuli (1961)	since 1942 selected into golden brown, polled beef breed
Amabowe (Mangwato)		Setswana
Ngami		gigantic long, lateral horns
Ngwato (Bamangwato)		longhorned or polled
Southern Tswana		+ Afrikander
	Tswana	
	Sekgatla	Southern Tswana × Afrikander
	Nguni (BP 1950)	absorbing varieties:
	Shangan	in process of absorption
	Bapedi	in process of absorption

	Bavenda Bolowana Ondongolo Pondo Zwazi Zulu	
Setswana		
Mangwato		partly founded Afrikaner
Namaqua		purchased since 1652
Cup-Shape-Horn		large type, long horns
Long-Twisted-Horn		large type, gigantic horns
Notch-Neck		short-legged type, most important foundation of:
Afrikaner (1907)		
Vaderlanders		Dutch cattle
Uysbees		Friesian, Groningens × Afrikaner, Nguni, Basuto
Kemp		Friesian × Afrikaner, Basuto
Tintern Black		Afrikaner × black Nguni combined in 1947
Drakensberger (1972)		
Subgroup 15A		
Marks line		
Woods line		
Wright line		
Texas Longhorn		consists of more breed lines
Griffin line		tracing to French cattle
Poppel line		from Georgia
Robinson cattle		crossbred from Mississippi
Tornhill line		
Pineywoods		consists of other lines and herds
Subgroup 15C		
Guatemalan Criollo	Barroso	one herd left, endangered
Costa Rica Criollo		
Nicaragua Criollo		
Criollo lechero tropical		bred since 1950, endangered
Subgroup 15D		
Perijanero	Mestizo perijanero	zebu × Sierra Criollo » crossbred population
Subgroup 15F		
	Curraleiro	only Crioulo Nordestino variety left
	Crioulo leiteiro de Irecé	
Beni Criollo	Yacumeño	selected since 1961
Franqueiro		

Pedreiro	Crioulo Lageano	reconstructed-Crioulo do Sul variety since 1960
Subgroup 16-1A		
Native cattle	Randall Lineback	
Holderness Columbian	Lineback (1987)	Shorthorn pre-breed Holstein, Ayrshire, Shorthorn crossbred any whitebacked dairy type
	Illawarra	mainly based on Shorthorn Australian Milking Shorthorn Darbalara
Subgroup 16-1B		
	Milking Shorthorn (1846)	
		Polled Durham (BS 1889)
Subgroup 16-2A		
	Murray Grey (BS 1962) Tasmanian Grey	Shorthorn × Aberdeen-Angus same cross since 1928 Absorbed in 1979
	Adapteur	
	Belmont Adapteur	discontinued breed line

Table S2. Export of breeds from different Groups. The year of the first import is given for the major importing countries Canada, USA, Brazil, Australia and New Zealand with, if known, abbreviations for the US or Canada states. Grey cells indicate 19th century imports.

* year of first entry.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Group 1								
Aberdeen-Angus	Scotland	1876	KS 1873	1906	1840s	1863	worldwide major beef breed	1971 repatriated <i>Angus</i> , except in Brazil
Ayrshire	Scotland	QC 1821	CT 1822	1937	1848	1884	19th: major imports in Nordic Europe	1970 repatriated
Belted Galloway	Scotland	ON 1939	20th	1952	1950s	1947	Germany, Netherlands	<i>Galloway</i> in Brazil
British White	UK		1940s					<i>American White Park</i> , crossed with White Park, Angus, etc.
Dexter	Ireland	from USA	NY 1905		1979	1979	worldwide	<i>Mini Dexter</i> in USA, Canada
Galloway	Scotland	ON 1853	1866		1952	1947	worldwide	
Highland	Scotland	MA 1885	1948			1973	worldwide	
Kerry	Ireland	ON 1971						
Kerry/Dexter	Ireland		1818				South Africa	
Luing	Scotland	1975	20th		20th	20th	Germany, Uruguay	from Canada to USA
Norwegian Red	Norway		1973		1990s		Latvia, Albania, Madagascar	in Australia only for crosses
Red Poll	England	NB 1880s	NY 1873	1920 *	1850s	1898	worldwide	
Shetland	Scotland						1983 Falkland Islands	
Swedish Mountain	Sweden						Germany	
Swedish Red	Sweden				1990s	21th		crossed into Aussie Red
Viking Red	Denmark, Sweden, Finland						UK	synthetic cross, used for upgrading dairy breeds
Welsh Black	Wales	from USA	NV 1966		>1973	1973	Germany, Uganda, Jamaica	
White Park	UK	ON 1940s	NY 1941		1958			<i>Ancient White Park</i>

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Group 2								
Angeln	Germany				1986		Belgium, Turkey Baltic countries, Eastern Europe	crossed into Aussie Red crossed into new red dairy breeds
Beef Shorthorn	Scotland	from USA	OH 1854				Germany, Japan, South Africa, Papua New Guinea	
Belgian White-Blue	Belgium	1986	1988	1994	21th		Europe, North America, Namibia	<i>Belgian Blue</i>
Bretonne Pie Noir	France						Madagascar	crossed into Rana and Amsterdam Island cattle
							Mauritius	crossed into Mauritius White
							Morocco, Algeria, Tunisia	only for crosses
British Dane (Danish Red)	UK			1990s	1990s	1990s	worldwide	for pure and crossbreeding,
Danish Red	Denmark				1990s		Baltic countries, Eastern Europe	crossed into new red dairy breeds
Devon	England	NB 1855	MD 1817	1906	1873	1838	worldwide	1855 import in Canada extinct
		ON 1968	NH 1929					<i>Milking Devon, Beef Devon</i>
Dutch Friesian; renamed Holstein (Group 16)	Netherlands; USA, Canada	1881	MA 1852	1907	1886	1884	worldwide top dairy breed	1968 repatriated
				>1945	1890	~1900		<i>New-Zealand Friesian;</i> In Brazil <i>Holandês Preto e Branco</i> for Dutch-Friesian + Holstein
Estonian Red	Estonia						Poland, Ukraine, Moldova Rep.	crossed into new red dairy breeds
Flamande	France			1945	1945	1945		<i>Flamenga</i> in Brazil; in Canada only for crosses; in Australia into Aussie Red

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in <i>Italics</i>)
		Canada	USA	Brazil	Australia	N.Z.		
German Red	Germany						Latvia	
Glan	Germany						Netherlands	
Guernsey	Guernsey	1878	NH 1830s	1889	~1900	~1900	worldwide	1990s repatriated
Heck	Germany						UK, France, Netherlands, Belgium, Latvia, Austria, Czech Rep., Hungary	
Hereford	England	ON 1860	NY 1839	1906	1826	1800s	worldwide major beef	1970s repatriated;
Polled Hereford (Group 16)	Canada/USA			1928	1920		breed	In Brazil <i>Hereford Môcho</i>
Irish Friesian	Ireland		1971					<i>Beef Friesian</i>
Jersey	Jersey	Q 1868	CT 1850	1896	ca. 1900	1862	worldwide major dairy breed	2008 repatriated
Jutland	Denmark						Netherlands	<i>Heidevee, Westergaard</i>
Lakenvelder	Netherlands		NY 1838				Belgium, England	1979 repatriated <i>Dutch Belted</i>
Dutch Belted (Group 16)	USA	20th				20th		
Latvian Brown	Latvia						Poland, Ukraine, Bulgaria	crossed into new red dairy breeds
Lincoln Red	England	1825 1866		20th	~1900	~1900	Germany, Hungary, Puerto Rico, Argentina (1887), Chili	1825 in Shorthorn HB 1866 new import
Lithuanian Red	Lithuania						Romania	crossed into Romanian Red
Longhorn	UK						Germany	
Maine-Anjou	France	1969	1969		20th		UK, Belgium, Netherlands, Germany, Japan	
MRY	Netherlands		2004		2004	2004	NW Europe	<i>Dutch Shorthorn</i> in Australia
Normande	France		1885	1890s			South America	1885 import extinct,
		1973	1970s					<i>Normando</i> in Brazil
Polish Red	Poland						Romania	crossed into Romanian Red

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Red Holstein (Group 16)	Canada/USA			>1945			worldwide	<i>Holandês Vermelho e Branco</i> for Red-Pied Friesian + American Red Holstein amalgamate
Red Pied Friesian	Netherlands			1907			UK	
Shorthorn [dual purpose]	England	NB 1825	NY 1817	1906	1825	1825	worldwide	<i>Milking Shorthorn</i> in USA, in Australia founder of beef and dairy types 1975 repatriated
South Devon	England	1969	1936	1948 *	1986		worldwide	
Sussex	England		TN 1884	20th	1970s		southern Africa, Argentina	1884 import extinct
			TX 1947					
Swedish Red-and-White	Sweden				20th		N.W. Europe, Russia	for crossbreeding in dairy breeds
Group 3								
Abondance	France	1969–1975					Côte d’Ivoire	in Canada only for crosses
Charolais	France	1953	TX 1934	1883	1971	1960s	worldwide top beef breed	<i>Charolês</i> in Brazil
Fleckvieh	Germany	1971	1971	1971	1988		central-eastern Europe	in Netherlands for crossings
French Simmental	France	1967	1967					
Gelbvieh	Germany, Austria	1972	1971	20th	20th		worldwide	
Hérens	Switzerland	20th	WV 1980					
Montbéliarde	France	1969-75		20th			worldwide	in Canada only for crosses
Pinzgauer	Austria	1972	1976	1970			worldwide	
Pustertal	Italy						Germany, Austria	
Simmental	Switzerland UK, Canada	1969	TX 1886	1905	1973	20th	worldwide	<i>Simental</i> in Brazil
Valdostana	Italy			>1995				experimental crossing

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Tux-Zillertal	Austria						Germany	
Vosgienne	France						Germany	
Group 4								
Aubrac	France	20th					Europe-wide, Northwest Africa. Mexico	
Bazadaise	France				1991		UK	
Blonde d'Aquitaine	France	1971	MN 1971	1994	1970		worldwide	
Gasconne	France						UK, Netherlands, Czech Rep., Japan	
Hinterwald	Germany					20th	Switzerland, Israel, Uganda. Namibia	
Limousin	France	1968	1968	1872	1973	20th	worldwide	
Maraîchine	France						Netherlands	
Parthenaise	France	1970					UK, Ireland, Belgium, Netherlands	<i>Parthenay</i>
Salers	France	1972	1974	1986 *			worldwide	
Swiss Brown	Switzerland	1888	MA 1869	1918				1976 repatriated as Brown Swiss
		1968	1983	1946			worldwide	original dual purpose <i>Braunvieh</i> , <i>Beef Brown Swiss</i> , <i>Pardo Cuíço Corte</i>
Brown Swiss (Group 16)	USA			1970s				<i>Pardo Suíço</i>
Tarentaise	France	1972	1972	1972 *			worldwide	
Tyrol Grey	Austria						Denmark, Latvia, Germany, Bulgaria, Serbia, Bosnia-Herzegovina, Macedonia, Israel	

Table S2. Cont.

Breed	Origin	Five major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Group 5								
Cachena	Spain						Germany	
Retinta	Spain						Argentina	
Rubia Gallega	Spain			21th				
Sayaguesa	Spain						Netherlands, Germany	pure and for building Tauros
Toro de Lidia	Spain						France, Mexico, Colombia, Equador, Peru, Venezuela	
Tudanca	Spain						Netherlands	
Group 6								
Chianina	Italy	1971	1971	1956	20th		worldwide	
Hungarian Grey	Hungary						Germany, Netherlands, Austria	
Marchigiana	Italy	1972	1972	1960s	20th		UK, Belgium, Netherlands, Albania, South Africa	Marky in USA, Canada
Maremmiana	Italy						Albania, Netherlands	in Netherlands for building Tauros
Modicana	Italy						Tunisia	crossed into Thibar
Piemontese	Italy	1980	1984	1974			worldwide	Piedmontese in USA, Piemontês in Brazil
Romagnola	Italy	1974	1971		20th		South Africa, Argentina	
Ukrainian Grey	Ukrain						Latvia	
Group 8								
Alambadi	India						Indonesia	crossed into Aceh with other zebu breeds
Amritmahal	India						Indonesia	
Gir	India		TX 1882	1911			worldwide (sub)tropical	in USA mainly crossed into Brahman

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Hallikar	India						Malaysia, Philippines	in Malaysia crossed in Local Indian Dairy with other zebu breeds
Hariana	India						Bangladesh	crossed into Pabna Milking Cow with other zebu and taurine breeds
							Myanmar, Cambodja	crossed into Pyar Sein with other zebu breeds
Hissari	Pakistan/India						Indonesia	crossed into Aceh with other zebu breeds
							Jamaica	crossed into Brahman <i>Jamaicano</i> with other zebu breeds
Kangayam	India			1963				
Kankrej	India		TX 1906	1870s			Indonesia, Senegal, Togo, Mauritius	<i>Guzerat</i> in USA mainly crossed into Brahman; <i>Guzerá</i> in Brazil
Khillari	India						Sri Lanka	
							Indonesia	crossed in zebus
Krishna Vally	India		1906					crossed into Brahman
Miniature zebu	India				1995			<i>Nadudana</i>
Mysore	India						Indonesia	Discontinued
							Jamaica	crossed into Brahman <i>Jamaicano</i> with other zebu breeds
Ongole	India		TX 1885	1874			worldwide (sub)tropical	<i>Nellore</i> , in USA mainly crossed into Brahman; <i>Nelore</i> in Brazil
Red Sindhi	Pakistan			1952	1954		worldwide (sub)tropical	<i>Sindi</i> in Brazil
Sahiwal	Pakistan				1954		worldwide (sub)tropical	

Table S2. Cont.

Breed	Origin	Five major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Tharparkar	India						Sri Lanka Malaysia Afghanistan, Myanmar, Philippines, Taiwan, Dem. Rep. Congo	<i>White Sindhi</i> crossed in Local Indian Dairy with other zebu breeds
Group 9								
Ala-Tau	Kazakhstan						Kyrgyzstan, Mongolia	
Japanese Black/Brown	Japan		1976				Ireland, Belgium, Germany, Netherlands, South Africa	<i>Wagyu</i>
Group 10								
Bali Cattle	Indonesia					NT 1849		Cobourg Peninsula, <i>banteng</i>
Madurese	Indonesia						Papua New Guinea	
Group 11								
Baoulé	Côte d'Ivoire						Centrafrique, Gabon, Congo, Dem.Rep.Congo, Liberia, Togo	
Lagune	Benin						Congo, 1904 Dem.Rep.Congo	<i>Mayombe</i>
	Dem. Rep. Congo						Belgium, then to Germany, Netherlands Gabon, Angola.	<i>Dahomey</i> <i>Dahomey, Daomé</i>
N'Dama	West Africa		VI 1860				West-, Central Africa, Kenya, Angola, South Africa; St. Croix Virgin Islands	×Red Poll: Senepol
Group 12								
Adawama	Nigeria						Ghana	
Azaouak	Nigeria						Ghana	
Senegal zebu	Senegal						Lesser Antilles 1828	
Shuwa Arabe	Nigeria						Togo	<i>Shuwa Aral</i>
Sokoto Gudali	Nigeria						Ghana	

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
White Fulani	Nigeria						Togo, Centrafrique, Ghana	
Group 13								
Angoni	Zambia						Zimbabwe	
Boran	Kenya				20th	1990	Ghana, Tanzania, South Africa, Mexico	
Butana	Sudan						Nigeria	
Group 14								
Afrikander	South Africa		TX 1931		1953		Africa, Philippines	in USA crossed into Barzona and Africangus, in USA and Australia <i>Africander</i>
Ankole-Watusi	European zoos		1960					
Barotse	Zambia						Dem. Rep. Congo	
Bonsmara	via Australia			late 1990s			Botswana, Rwanda	
Nguni	Zambia						Gabon	
Tonga	Zambia						Dem. Rep. Congo	
Tuli	Zimbabwe		1991	1990s	1990		Botswana, Gabon	in USA and Australia only for crosses; into Brazil via Australia
Group 15								
Jamaice Hope	USA						Central, South America	probably discontinued
Romano Rojo	Dominican Republic						Guiana	
Texas Longhorn	USA					1989	Germany, Netherlands	
Group 16								
Australian Braford	Australia					20th	Papua New Guinea, Samoa, Malaysia, China	

Table S2. Cont.

Breed	Origin	Five Major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Australian Frieswal	Australia						Papua New Guinea, Indonesia, Malaysia, Philippines, Sri Lanka	
Australian Lowline	Australia					1995		<i>Mini Angus</i>
Australian Milking Zebu	Australia						Papua New Guinea, Pakistan, India, Sri Lanka, Pakistan, Indonesia, Malaysia, Tanzania, Panama, Trinidad, Tobago, Surinam	
Australian Shorthorn	Australia		~1990s					only for crosses
Beefalo	USA			1991				
Beefmaster	USA			1992			Argentina, South Africa	
Braford	USA			1994	20th		Argentina, Ghana	
Brahman	USA			1994	1933		worldwide (sub)tropical	
Brangus	USA						Panama, Dominican Rep., Bolivia, Argentina, South Africa	
Brangus Plus	USA			late 1990s				<i>Brangus Plus Vermelho</i>
Canadienne	Canada						France	
Charbray	USA			20th			Central and South America, Morocco, South Africa	
Droughtmaster	Australia			late 1990s			Papua New Guinea, Indonesia, Malaysia, China, Taiwan, Pakistan, Ghana, Nigeria	
Illawarra	Australia						Papua New Guinea, Pacific, Indonesia, Southwest Asia, Philippines, Japan, Pakistan, Central America, Cuba, UK	
Indubrasil	Brazil		1946				Central America, Paraguay, Peru, Surinam, Venezuela	
Murray Grey	Australia	1972	TX 1969			20th	Sri Lanka, Japan, UK	

Table S2. Cont.

Breed	Origin	Five major Importing Countries, Year(s) or Century of First Import					Other Importing Countries	Remarks (New Names of Imports in Italics)
		Canada	USA	Brazil	Australia	N.Z.		
Range Maker	USA			late 1990s				only for crosses
Red Angus	USA			1936 *	20th		UK, Thailand	
Rojo Jamaicano	Jamaica						Domin. Rep., Trinidad and Tobago, Venezuela, Panama	
Santa Gertrudis	USA	1952		1953	1952		worldwide (sub)tropical	
Senagus	USA			late 1990s				
Senepol	USA			late 1990s			South Africa	
Simbrah	USA						South Africa	
Stabilizer	USA			late 1990s				only for crosses
Weebollabolla	Australia	20th					South Africa	in Canada only for crosses

Table S3. Synthetic breeds (Felius, 1995; Mason, 2002; Buchanan and Lenstra, 2014).
BS breed society; CC, continuous cross; HB herd book.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Europe			
Dairy			
Ukrainian Red Steppe × Red Holstein	Ukrainian Dairy Red	Ukraine	1989
CC dairy/dairy-beef			
Norwegian landraces and breeds × Ayrshire, Swedish Red-and-White, Dutch Friesian, Holstein	Norwegian Red	Norway	1961
Finnish Ayrshire, Swedish Red, Danish Red, Norwegian Red, Holstein	Viking Red	N.W. Europe	
Holstein, Montbéliarde, Swedish Red-and-White	ProCross	N.W. Europe	planned 2014
Ramo Grande × Dutch-Friesian, Danish Red, Ayrshire, Jersey, Guernsey, Normande, Brown Mountain	Madeire Mixed		Azores
Beef			
Highland × Whitebred Shorthorn (Parton Herd)	Luing	Scotland	1949–1965, HB 1966
German Black Pied, German Red Pied, Fleckvieh × Aberdeen-Angus, Angus	German Angus	Germany	1950s, HB 1956
German Fleckvieh × Charolais	Uckermärker	Germany	1975, HB 1992
Hungarian Pied × Polled Lincoln Red	Scentes Red	Hungary	recognized 1992
Ukrainian Grey, Ukrainian Simmental × Charolais, Chianina	Ukrainian Beef	Ukraine	1961, HB 1999
Swiss Brown, Simmental, Salers, Limousin, Maine-Anjou	Belarus Synthetic		
Red Steppe × Hereford, Charolais, Cuban zebu	Askian Meat	Ukraine	
Kalmyk × Aberdeen-Angus, Charolais	New North Caucasian	S.E. Russia	
CC beef			
South Devon, British Limousin, British Holstein × Australian Stabiliser (= Gelbvieh, Hereford, Red Angus, Simmental)	Stabiliser	©England	1999
Park management/ rewilding			
Shorthorn, Highland Burnt Red × Salers	Wilseder Red Red Beggar	Germany Netherlands	2005
Danish Red, Holstein, Danish Red Pied, Aberdeen-Angus, Galloway, Hereford, Simmental, Charolais, Limousin, Blonde d'Aquitaine, Romagnola, Chianina	Danish Forest	Denmark	
Angeln, German Black Pied, Allgäuer, Murnau-Werdenfels, Highland, Hungarian Grey Steppe, Corsican, Camargue, Spanish Fighting cattle	Heck cattle	Germany	1921-1940s, HB1934

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Heck × Highland	Ecoland	Netherlands	1990s
Heck cattle × Sayaguesa, Chianina, Hungarian Grey, Watusi, CC	Taurus	Germany	1991
Highland × Maremmana primitivo, Podolica, Pajuna, Tudanca, Limiana, Sayaguesa, Maronesa, CC	Tauros	Netherlands	1990s
Asia			
Taurine dairy/dairy-beef			
Georgian Mountain, Dagestan Mountain, Mingrelian Red × Brown Mountain	Caucasian Brown	Georgia and Dagestan	1930–1960
Azerbaijan Red × Swiss Brown, Kostroma, Lebedin	Azerbaijan Brown	Russian Azerbaijan	1930–1960
Kyrgyz × Dutch Friesian, Simmental, Swiss Brown, Kostroma	Ala-Tau	Kyrgyzstan and Kazakhstan	1929–1940 HB1950
Mongolian × Milking Shorthorn	Caoyuan Red	N.and N.E. China	1950
Taurine beef			
Mongolian x Hereford	Mongolian Whiteheaded	Mongolia	
Altay (Hazake) x Hereford	Altay Whiteheaded	N.W. China	
Kalmyk × Hereford	Byelagolova	N. Kazakhstan	1928–1939, HB
Kalmyk × Hereford, Charolais, CC	Aulieakol	N.Kazakhstan	BS
Taurindicine dairy/dairy-beef			
Central Asian zebu × Dutch Friesian, German Friesian, Swiss Brown, Simmental	Bushuev	Uzbekistan	1907–1948
Tadzhik zeboid × Russian Brown	Schwyz-Zeboid	Tajikistan	1937
Tadzhik zeboid × Swiss Brown	TSSH-1	Tajikistan	1985
Red Sindhi × Jersey	Jersind	N. India	1950
Sahiwal × Dutch Friesian, Holstein	Frieswal	Uttar Pradesh, India	1987
Sahiwal, Red Sindhi × Swiss Brown	Karan Swiss	Haryana, India	1963
Gir × Holstein, Jersey	Phule Triveni	Maharashtra, India	
Tharparkar × Holstein, Brown Swiss, Jersey	Karan Fries	Haryana, India	1971
Haryana, Ongole, Gir × Dutch Friesian, Jersey, Swiss Brown	Kamaduk	India	
Bengali × Sahiwal, Red Sindhi, Haryana, Dutch Friesian, Jersey	Pabna	Bangladesh	1915–1975
Nadudana × Jersey, Swiss Brown, Brown Swiss, Holstein	Sunandini	Kerala, India	1981–1987
Hazake × Swiss Brown	Xinjiang Brown	Xinjiang, China	1952
Vietnamese × Red Sindhi	Laisind	Vietnam	
Local Indian Dairy × Holstein, Australian Friesian-Sahiwal, CC	Mafriwal	Malaysia	
Taurindicine beef			
Azerbaijan Zebu × Estonian Black Pied, Aberdeen-Angus	Azangus	Azerbaijdzjan	

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Bhagnari × Droughtmaster	Nari Master	Pakistan	1969
Kedah-Kelantan × Brahman	Brakmas	Malaysia	
Kedah-Kelantan × Charolais	Charoke	Malaysia	
Simmental × Hereford and Red Angus, St. Gertrudis, Brahman	Israeli Red	Israel	
Africa			
Local triple purpose (dairy, work, beef)			
N'Dama, Gobra	Bambey	Senegal	1921
N'Dama, Gobra	N'Damazza	Côte d'Ivoire	
N'Dama, Ghana Sanga, Sokoto Gudali	Ndagu	Ghana	1923
Taurindicine dairy-beef (local × exotic)			
Malawi Angoni × Friesian	Mikolongwe	Malawi	1971
Madagascar Zebu × French Brown Mountain	Manjan 'i Boina	Madagascar	1980s
Nguni × Jersey	Tauricus	Kwa-Zulu Natal	
Nguni × Pustertal	Supertaler	South Africa	
N'Dama × Fleckvieh, Abondance	N'Damance	Côte d'Ivoire	1980
Egyptian × Holstein/Jersey, CC	Khalit	Egypt	
Egyptian × Holstein/Jersey, CC Tanganyika			
Shorthorn Zebu, Ankole × Red Sindhi, Sahiwal, Kenya Boran, Ayrshire, Jersey, CC	Mpwapwa	Tanzania	1940s
Taurindicine beef			
Tuli, Nguni	Okuma	Gabon	
Afrikander, Nguni	Sanganer	South Africa	BS 1997
Nguni × Kenya Boran	Borguni	South Africa	2005
N'Gaoudéré × Brahman	Wakwa	Cameroon	1952
Madagascar Zebu × Afrikander, Limousin	Renitelo	Madagascar	1930–1972
Tswana, Tuli × Brahman, Bonsmara, Simmental	Musi	Botswana	1983
Afrikander × Hereford, Shorthorn	Bonsmara	South Africa	1936–1955, HB 1972
Yellow Afrikander × Brown Swiss	Holmonger	Namibia	1949
Afrikander × Simmental, Hereford	Nuras	Namibia	1960s
Afrikander × Charolais	Huguento	South Africa	recognized 1995
Afrikander × Angus	Afrigus	South Africa	
Afrikander × any other beef breed, CC	Africarne	South Africa	
Afrikander × Simmental	Afrisim	South Africa	
Afrikander × any other beef breed, CC	Veldmaster	Zimbabwe	
African × European, CC	Bovelder	South Africa	
African × European, CC	Symons cattle	Kwa-Zulu Natal	
Central and South America			
Taurine dairy/dual-purpose			
Criollo × Holstein	Taino	Cuba	
Criollo × Durham	Doran	Costa Rica	1850s
Hartón × Holstein, Milking Shorthorn	Lucerna	Colombia	1937–1956
Taurine beef			
Criollo × Limousin	Crimousin	Cuba	

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Caracu × Blonde d'Aquitaine	Aquitânica	Rio Grande do Sul, Brazil	1975
N'Dama × Red Poll	Senepol	St Croix, Caribbean (USA)	1918–1949, BS 1976
Aberdeen-Angus, Limousin	Limangus	Argentina	
Taurindicine dairy/dual-purpose			
Criollo × Shorthorn, zebu	Achiote	Guatemala	
Limonero, mestizo × Swiss Brown	Caroreña	Venezuela	1935–1975 BS
Dutch Friesian/Holstein × Gir	Girolando	Brazil	early 1900, HB 1989
Holstein × Cebú Cubano	Siboney de Cuba	Cuba	1965
Holstein × Cebú Cubano	Mambi	Cuba	
Holstein × Santa Gertrudis	Caribe	Cuba	
Holstein × Guzerá	Riopardense	São Paulo, Brazil	1953
Holstein × Guzerá	Guzolando	Brazil	HB 1984
Holstein × Nelore, Guzerá	Xingu	Goiás, Brazil	1970
Holstein × Indubrasil, Guzerá	Santa Mariana	Brazil	
Holstein, Jersey × Sahiwal	Jamaica Hope	Jamaica	1920–1952, HB 1953
Jersey × Gir	Girsey	Brazil	1980
Jersey × Red Sindhi	Jerdi	Brazil	
Red Poll × Guzerá, Gir	Pitangueiras	São Paulo, Brazil	1940, HB1976
Red Poll × zebu	Rojo Jamaicano	Jamaica	1880, HB 1952
Brown Swiss × Indubrasil	Itapetinga	Bahia, Brazil	1960s
Brown Swiss × Guzerá, recently Nelore	Lavinia	São Paulo, Brazil	1954, HB
Pinzgauer × Girolando	Jaguanês	Brazil	
Girolando, Pitangueiras	Pitalanda	Minas Gerais, Brazil	1977
Girolando, Guzerá	Guzerolando	Brazil	1966
Taurindicine beef, 2 breed			
Curraleiro × zebu	Casteado	N.E. Brazil	
Hereford × Brahman	Herebu	Argentina	
Hereford × zebu	Braford brasileiro	Brazil	
Hereford × zebu	Pampiano-Braford	Rio Grande do Sul, Brazil	1970s
Aberdeen-Angus × Brahman Jamaicano	Negro Jamaicano	Jamaica	BS 1954
Aberdeen-Angus × Nelore	Brangus-Ibagé	Rio Grande do Sul, Brazil	1945, HB 1981
Aberdeen-Angus × Nelore	Natura	Brazil	
Charolais × Cebú Cubano	Chacuba	Cuba	
Linousin × zebu	Indusin	Argentina	
Simmental × Guzerá	Simbrasil-Cariri	Brasil	1960s
Chianina × Nelore	Caiuá	São Paulo, Brazil	1978
Marchigiana × Nelore	Suiá	Matto Grosso, Brazil	
Piemontese × Nelore	Piemonel	São Paulo, Brazil	
Taurindicine beef, 3 breeds			
Caracú, Mocho Nacional × zebu	Carazebú		

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Romosinuano × Red Poll × zebu	La Velásquez	Colombia	
Devon, Nelore, Tabapuã	Bravon	Brazil	
Normande × Nelore, Tabapuã	Branor	São Paulo, Brazil	1950
Charolais × Nelore/Tabapuã	Charbray	Brazil	
Taurindicine beef, multi-breed			
Charolais × Nelore, Indubrasil, Guzerá	Canchim	São Paulo, Brazil	1940, HB 1971
Criollo × Mysore, Nelore, recently	Romano Rojo	Dominican Rep	1922
Charbray, Charolais			
Red Angus × Tabanel, later: Limousin, Santa Gertrudis	Red Norte	Minas Gerais, Brazil	
Polled Hereford × Brahman, later: Nelore, Tabapuã, Zebu mocho	Santa Clara	Rio Grande do Sul, Brazil	1968
Simmental × Nelore, Guzerá, Gir, Indubrasil, Tabapuã	Simbrasil	Brazil	
Senepol, Charolais × Barzona, Brahman	Tropicarne	Mexico	BS 1986
Red Angus, Charolais, Simmental, Chianina × Nelore	Bos Certus	Brazil	
Caracú, Romosinuano × Senepol, Red Angus, Devon, South Devon, Gelbvieh, Simmental × Bonsmara, Tuli, Belmont Red × Nelore, Boran	Montana	Brazil	
Zebu beef			
Mysore, Hissar, Kankrej, Gir, Ongole	Brahman Jamaicano	Jamaica	1860, HB 1949
Gir, Nelore, Indubrasil	Cebú venezolano	Venezuela	BS
Guzerá, Nelore, Hissar, Gir	Indubrasil	Minas Gerais, Brazil	1911, HB 1936
Nelore × non-specified polled zebu	Tabapuã	São Paulo, Brazil	1940s, HB 1961
Tabapuã, Nelore	Tabanel	Goiás, Brazil	HB 2003
North America			
Taurine dairy			
Holstein, Brown Swiss, Simmental	Dairy Synthetic	Alberta	
Taurine, beef, 2 breeds			
Texas Longhorn × Salers	Salorn	Texas	1983, BS 1988
Texas Longhorn × Gelbvieh	Geltex	USA	BS
Texas Longhorn × Devon	Texon	Texas	1989
Shorthorn, Devon	Makaweli	Kauai, Hawaii	19th century
Hereford, Chianina	Chiford	USA	1988
Angus, Maine-Anjou	Black Maine-Anjou	USA	BS 1969
Angus, Beef Friesian	Amerifax	Nebraska	1971, HB 1977
Angus, Gelbvieh	Balancer	Colorado	
Angus, Chianina	Chiangus	USA	1975
Angus, Wagyu, CC	Wangus	USA	
Red Angus, Charolais	M4 (Heyster)	USA	1960s
Lincoln Red, Charolais	Fort Cross	Ontario	
Brown Swiss, Charolais	Char-Swiss	Nebraska	BS 1961

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Maine-Anjou, Chianina	Chimaine	USA	1987
Romagnola, Marchigiana	Romark	Canada	1970s
Taurine, beef, 3 breeds			
Hereford, Holstein, Brown Swiss	Hays Converter	Alberta	1952, BS 1975
Hereford, Angus, Brown Swiss	Better Idea	North Dakota	
Hereford, Red Angus/Angus	Regus	Wyoming	
Hereford, Red Angus, Red Holstein	RX3	Iowa	HB 1974
Hereford, Shorthorn Charolais	Burwash	Ontario	1957
Angus, Galloway, Charolais	Kinsella	Alberta	1955
Angus, Galloway, Lineback	Speckled Park	Alberta	
Angus, South Devon, Tarentaise	Range Maker	Florida	
Taurine, beef, multi-breed			
Hereford, Angus, Red Poll, Beef Friesian Brown Swiss, Simmental	Beef Machine	New Mexico	
Hereford, Angus, Galloway, Charolais	Pee Wee	Alberta	
Hereford, Angus, Brown Swiss, Charolais	Cash	Montana/Colorado	1960
Hereford, Angus, Red Angus, Red Poll, Pinzgauer, Charolais, Gelbvieh, Simmental, CC	MARC	Nebraska	
Hereford, Red Angus, Galloway, Welsh Black, Longhorn, Brown Swiss, Jersey, Holstein	Beefbooster	Canada	1993
Angus, South Devon, <i>Salers</i> , Tarentaise	Range Maker	Florida	Angus, South Devon, <i>Salers</i> , Tarentaise
Angus, Continental beef breeds	Black Maximizer	Montana	Angus, Continental beef breeds
Angus, Galloway, Brown Swiss, Charolais Angus, Dutch Belted, Shorthorn, Belted Galloway, later Highland, Chianina, Limousin, <i>Salers</i>	Beef Synthetic	Alberta	
White Park, British White + Shorthorn, Holstein, Angus	American British White Park		HB 1975
Devon, Galloway, Highland, Lincoln Red South Devon, Blonde d'Aquitaine, Gelbvieh, Maine-Anjou, <i>Salers</i>	Shaver	Saskatchewan/Alberta	
Taurindicine, beef, 2 breeds			
Shorthorn × Brahman	Santa Gertrudis	Texas	1910–1940, HB 1951
Hereford × Brahman	Braford	Florida	HB 1945
Hereford × Brahman	Victoria	Texas	1946
Angus × Brahman	Brangus	Louisiana	1932, BS 1949
Angus × Africander	Africangus	Louisiana	1952–1963
Lowline Angus × Brangus	Mini Brangus	USA	
Red Angus × Santa Gertrudis	Polled Santa Gertrudis		
Red Angus × Red Brahman	Red Brangus	Texas	BS 1956

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Red Angus × Brahman	Angus/Brangus Plus		
Susse × Brahman	Sabre	Texas	1950
Devon × Brahman	Bravon	Texas	
South Devon × Brahman	South Bravon	Southern USA	
Brown Swiss × Brahman	Brah-Swiss	Texas	
Charolais × Brahman	Charbray	Texas, Louisiana	1936, HB 1949
Maine-Anjou × Brahman	Brah-Maine	USA	BS 1985
Limousin × Brahman	Brahmousin	Southern USA	1969, BS 1984
Polled Limousin × Red Brahman	Bravado	Oklahoma	1986
Salers × Brahman	Bralers	Texas	
Normande × Brahman	Branor	Texas	
Simmental × Brahman	Simbrah	Texas, Oklahoma	HB 1977
taurindicine, beef 3 breeds			
Shorthorn, Hereford × Brahman	Beefmaster	Texas	1931–1949, BS 1961
Shorthorn, Hereford × Brahman	Beefmaster	Colorado	BS 1971
Hereford, Charolais × Brahman	Charford	Arizona	1952
Hereford, Simmental × Brangus	Simbrangerford	Texas	
Angus, Gelbvieh × Brahman	Noble Line	Oklahoma, Texas	
Red Angus, Gelbvieh × Santa Gertrudis	Santa Cruz	Texas	1990
Red Angus, Senepol, Simmental	Hotlander	Texas	
Gelbvieh × Brahman, recently Red Angus	Gelbray	USA	HB 1981
Taurindicine, beef, multi-breed			
Hereford, Red Angus, Senepol × Barzona	South Poll	Alabama	1989
Angus, Charolais, Limousin, Chianina × Santa Gertrudis	Cuprem Hybrid	Nebrask	1960–1976
Maine-Anjou, Charolais, Tarentaise, Limousin, Salers, Gelbvieh × Beefmaster	Beefbooster	Canada	1993
Red Holstein, Brown Swiss, Milking Shorthorn, Beef Shorthorn, Hereford, Red Angus, Highland, Simmental × Beefmaster, Brahman	Ranger	Wyoming, California	1950
Shorthorn, Hereford, Angus × Africander Brahman	Barzona	Arizona	BS 1968
Shorthorn, Hereford, Angus, Brown Swiss Charolais × Brahman	Beefmaker	Nebraska	1960s
taurine × zebu, CC	Bucking Stock	USA	
Zebu beef			
Gir, Ongole, Kankrej, Red Sindhi, Krishna Valley	American Brahman	Southern USA	1880s, HB 1924
Valley	American Brahman	Southern USA	1880s, HB 1924
Unknown origin, beef			
CC	Magnum		
Texas Longhorn × others	El Monterey	California	

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Miniature			
Dexter × Jersey	Mini Belmont/Mini Belfair	Washington	
Belted Galloway, BueLingo, Dutch Belted, Dexter	Mini American Beltie	USA	
Dexter × Angus, Hereford, Highland, Belted Galloway, Jersey or others, CC small zebu CC	Happy Mountain/Mini Grad-Wohl Miniature Zebu Miniature Spanish Las Manchas	USA	
Texas Longhorn × Dexter	Mini Brangus	USA	
Lowline Angus × Brangus	Sundog	Texas	
taurine × Miniature zebu CC	Little Rowdy	USA	
Cattle × bison, beef			
taurine beef breeds × bison	Beefalo	Wyoming, US	1965, HB 1983
Hereford, Simmental × bison	Simmalo	California, US	
Shorthorn, Charolais, Brahman x bison	American Breed	New Mexico	1948–1974, HB1971
Angus, Brown Swiss, Simmental, Brahman × bison Australia/New Zealand	Hybridmaster	Oklahoma	1965
Taurine dairy			
Jersey, Friesian, Ayrshire	Kiwi	North Island, New Zealand	
Jersey, Friesian / Holstein CC	Kiwi	New Zealand	
Nordic and Red Pied Lowland breeds, CC	Aussie Reds	Australia	1986
all dairy breeds, CC	Australian Commercial Dairy	Australia	1985
Taurine, beef			
Shorthorn, Aberdeen-Angus	Murray Grey	Victoria	1905, BS 1962
Shorthorn, Aberdeen-Angus, grey cattle	Australian Grey	Australia	BS 1979
Shorthorn, Hereford	Adapteur	Queensland	1953
British White, White Galloway	Australian White	New South Wales	1958, BS 1983
Murray Grey × Charolais	Chargrey	Victoria	
Hereford, Simmental	Simford	New South Wales	1970s
Hereford, Simmental	Beefmaker	New South Wales	1973
Red Angus, South Devon, Salers, Simmental, Gelbvieh, CC	Leachman Hybrids	Australia, New Zealand	
Hereford, Red Angus, Simmental, Gelbvieh	Stabilizer	New Zealand	
Taurindicine dairy			
Jersey × Sahiwal	Australian Milking Zebu	New South Wales	1950s, BS 1973
Holstein × Sahiwal	Australian Frieswal	Queensland	1961, HB 1983
Holstein × Sahiwal	Taurindicus	New Zealand	cont. cross

Table S3. Cont.

Input Composite	Breed Name	State, Country	Establishment HB, BS
Taurindicine, beef			
Beef Shorthorn × Sahiwal	Quasah	Queensland	1972
Hereford × Brahman	Australian Braford	Queensland	1946–1952, HB 1956
Hereford, Shorthorn, Africander	Belmont Red	Queensland	1953–1968, HB 1968
Angus × Brahman	Australian Brangus	Australia	1951, HB 1956
Murray Grey × Brahman	Greyman	Queensland	1970s
Charolais × zebu	Charbray	Australia	
Red Poll, Shorthorn, Hereford, Devon × Santa Gertrudis, Red Brahman, possibly Afrikander	Droughtmaster	Queensland	1931, HB 1956
Aberdeen-Angus/Hereford, Friesian, Charolais × Brahman	Wokalup	West Australia	
Poll Shorthorn, British White, Charolais × Brahman	Mandalong Special	New South Wales	1965, BS
Miniature			
Dexter, Murray Grey, Later Friesian, Hereford, CC	Kyrhet Australian Miniature	Australia	
Shorthorn, Aberdeen-Angus	Aussie Miniature Grey	Queensland	HB 2003
Australian Lowline × Brahman	Bramalow	Australia	
unknown	Sundogs	Australia	
small Indian zebus	Nadudana	Australia	
Pacific islands			
Taurindicine beef			
Hereford, Shorthorn × Droughtmaster, Santa Gertrudis, Brahman	Solomon Red	Solomon Islands	1970–1980s
unknown	Yalavou	Fiji, Melanesia	1984

Table S4. Extinct breeds (Felius, 1995; Porter, 2002).

Country	Breed	Remarks	Year/Period of Extinction (If Known)
Group 1			
Lithuania	Polled Lithuanian land cattle	from west Lithuania	
	Orkney	Orkney island, comparable to Shetland	
Scotland	Fifeshire	Highland × South English and Dutch, from Fife peninsula	late 19th century
	Lord Caernarvon's breed	Hampshire	
England	Earsham Polled	Belted cattle from Bungay district, extinct	late 19th century
	Montgomeryshire	Welsh	1919
	Irish Dun	grey to dun variety	1974
	Donegal Reds	red variety	
Ireland	Drimmon	possibly still existing	
	Polled Irish	black or roan landrace	
Group 2			
	Glamorgan	South Welsh	late 19th century
	Beevbilde	Lincoln Red, Shorthorn, Aberdeen-Angus composite	1950s
England	Black Beevbilde	Polled Lincoln Red, Polled Shorthorn, Aberdeen-Angus composite	1960s
	Sheeted Somerset	descending Lakenvelder	1934
Ireland	Irish Longhorn	possibly British Longhorn variety	
Netherlands	Sand and heather land cattle		early 20th century
	Maroillaise or Ardennais-Flamande	transitional Flamande-Bleue du Nord	
	Solzerienne	from forests in department Nord	
	Bretonne de Saint Brieux	from Bretagne, resembled early Jersey	
	Rennaise	Poitevine × Bretonne cows	
	Bazougers	Maine-Anjou type	2010 one cow left
France	Sarlabot	Suffolk Polled × local French in Normandy, recognized in 1852	1907
	Durcet	Normande type cattle × early Swiss Brown bred since 1825, outcrossed with Durham since 1838	late 19th century
	Cornouailles	Pied landrace in S.W. Bretagne	
	Meusienne	N. French × Comtoise, Fribourg, Bernese	
	Eifel breed	Ardennes cows × Glan	
Latvia	Latvian Red Pied	from Livonia	
	Latvian Light red		
Group 3			
Netherlands	Bovian	Charolais × Blonde d'Aquitaine	1990s

Table S4. Cont.

Country	Breed	Remarks	Year/Period of Extinction (If Known)
Germany	Schönwäld	comparable to Hinterwäld	
	Westwäld	Blazed red triple-purpose,	
	Bavarian Red	Breed society 1898-1940	
	Sechssämt	Bavarian Red mountain variety	
	Weida	Bavarian Red variety	
	Chamau	Bavarian Red poor variety	
	Wittgenstein Blazed	work breed, HB 1899	late 1960s
	Siegerland	Red Highland variety	
	Röhn	Red Highland variety	
	Spessart	Red Highland variety	
Austria	Kellheim	Bavarian red blazed work breed, HB 1902	extinct 1945
	Maltein	Red land cattle × Grey Steppe origin, with curled yellow coat	
Czech Republic	Sudeten Red	poor type triple-purpose highland	
	Kladsko-Sudeten Red	improved crossbred	
Slovakia	Mariadvur	Austrian Mariahof bred in Bohemia	
	Slovakian Red	Poor type from West Carpathians	
Poland	Sandeck	Yellow to red and dun triple-purpose from West Carpathians	
	Kreuzberg	Small, short-headed, brown to black, outstanding work breed	
	Pomurska	Murboden type	1980
Slovenia	Slovenian White	Austrian Blond type	
	Koruska Blond	Austrian Blond type	
Group 4			
France	Angavine	Vandéenne work-beef variety	
	Gâtinaise	Vendéenne beef type	
	Gâtinaise-Choletaise	Vendéenne beef type	
	Solognote	Vendéenne small, poor type	
	Berrichonne-Brennouse	Marchoise × Parthenaise cross	
	Mézenc	Comtoise blond breed, early 19th century Cévennes cattle-Aubrac-Quercy-Limousin crossbred	1975 last bull slaughtered; 1975 last cow alive
	Vivardaise	landrace from Ardèche	
	Albanaise	landrace from Haute-Savoie	
	Beafort	Tarentaise-Abondance intermediate or Tarentaise × Albanaise crossbred	
	Dachau Moor	from Bavarian high moorlands	
Italy	Bardigiana	from Parma, similar to Pontromolese	
	Cornigliese	Bardigiana variety	
	Valtarese	Bardigiana variety	
	Valtellina	miniature Grey Alpine	

Table S4. Cont.

Country	Breed	Remarks	Year/Period of Extinction (If Known)
Switzerland	Graubünden-Oberland	minitature Grey Alpine type from Swiss-Austrian border	
	Bündner Mountain	small Grey type from Albulah high Alps	
	See	small Grey type from Tyrol	
	Lechtal	Grey dairy type transitional between Allgäu and Montafon	
Austria	Wipptal	Etchtal (Grey Adige) type, popular triple-purpose breed	
	Kematen	Grey type with Tuxer influence	
	Sterzing	Grey type with Tuxer influence	
	Selrain	Grey type with Tuxer influence	
	Stubai	Grey type with Tuxer influence	
	Brenner	Grey type with Tuxer influence	
Poland	Polish Brown	from Carpathian Mountains	
	Obstesc	Buscha type	
Romania	German Rosie	presumed Romanian Mountain × German Red Highland from high mountains	
	Risca	fine, blond dairy type	
	Kranjsko	Buscha type	
Croatia			
Bosnia- Herzegovina	Imljani Black	Buscha type	
Serbia, Montenegro	Pester Buscha		
Greece	Corfu	island breed, work-dairy, in 1930s considered best dairy cattle of Greece	
	Epiros	Stocky mainland type	
	Pieira	from Central Macedonia	
	Skýros	from Sporades island	1970s
	Samos Island Dwarf	possible same as Parot Pigeon	
	Parot Pigeon	feral in high mountain range	1985 last observed
	Rhodos	consisted of two types	
	Mediterranean-Anatolian		
	Primitive	Miniature work cattle, also milked	
	Cretan lowland		
Group 5	Cretan mountain		
	Gávdos	Island cattle	1990
France	Provençale	Camargue type around Saint-Tropez	

Table S4. Cont.

Country	Breed	Remarks	Year/Period of Extinction (If Known)
Spain	Agrupación Eo	from N. Asturias, small, long-horned, yellow or pied dairy-beef type	around 1986 bred out by Swiss Brown
	Leonesa	triple purpose breed from southern slopes Cantabrian Mountains, HB	
	Campurriana	Cantabrian valley type	
	Lebaniega	small hill type from West Santander	
	Marinera	early Galician type	
	Llanuras	large dark colored work breed from North and Central Spain	
	Agrupaciones-Serrañas	mountain cattle from East Spain	
Group 6			
Italy	Berciana	Transitional between Grey Alpine and Podolian type	Early 20th
	Bolognese	comparable to Romagnola	
	Pugliese del basso Veneto	Descending of Hungarian Grey	
Romania	Ialomita		1960s last state herd abandoned
	Danube miniature	fast trotting cattle	1962 last state herd abandoned
	Transylvanian Steppe	Herd book 1924	
	Bucsana	Podolian-Illyrian from Carpathians	
Bosnia- Herzegovina	Tolmeind	Podolian-Illyrian dairy cattle	
	Wocheind	Podolian-Illyrian mountain dairy cattle	
Croatia/Serbia	Posavina	Podolian-Illyrian from Sava river valley, backward curled horns	
Bulgaria	Stara Planina	Podolian-Illyrian mountain type	
Albania	Mursi	descending Bulgarian Podolian	
Greece	Greek Steppe	from Northeast Greece	
	Thessaly	akin to Katerini Steppe	
Turkey	Malakan	from Northeast Anatolia, dairy type, entered from Russia, unclear descent	
Russia	Tschernomeridian	from Kosak region, presumed some zebu influence, neck-wither hump, long, waved coat	
	Kuban-Black Sea	from North Caucasus, triple-purpose	
Dagestan	Cherkassy	light built, yellowish-brown, medium long horns	
Group 7			
Turkey	Diyarbakir	Anatolian Black × zebu	
	Karacadag	Anatolian Black outcrossed by West European breeds	

Table S4. Cont.

Country	Breed	Remarks	Year/Period of Extinction (If Known)
Greece	Tinos	Damascus dairy type	1990s
	Andros	Damascus type	
	Naxos	Damascus type	
	Asguru	from Rhodos	1970s
	Kos	descending Tinos cattle	
	Tilos Island	Damascus dwarf type	
Turkey	Urla	from Urla peninsula	
Group 8			
Turkmenistan	Kuramin	bred out by exotic breeds	1960s
	Fergana	bred out by exotic breeds	
India	Brownsind	Brown Swiss × Red Sindhi	
	Kangam	akin to Naattukuttai	
	Madras Red	South Indian dwarf zebu	
	Malabar	from Kerala	
Bangladesh	Kamdhino	dwarf zebu	
Group 9			
Russia	Russo-Siberian	land cattle	
China	Gaotai	comparable to Menggu	
	Yangba	from Gansu	
	Tangjiao	from Qinhai	
	Meiniu	dwarf cattle in ancient China	
Japan	Shusuku Tsuru	Authentic Wagyu type breed	
	Yoshi Tsuru	variety of Shusuku Tsuru	
	Fuki Tsuru	variety of Shusuku Tsuru	
	Atsuta Tsuru	variety of Shusuku Tsuru	
Group 11			
Tunisia	Béja	Guelma × Brown Mountain	
	Ichkeul	Guelma × Charolais	
	Mateur	Guelma × Tarentaise and zebu	
	Blonde-du Cap Bon	multiple crossbred	
Ethiopia	Gimira	longhorned taurine type	
Togo	Avétonou	N'Dama + WAS × Gelbvieh	
Senegal	Senegambian Shorthorn	in Casamanca extinct 1970s	
Ghana	Ghana Dwarf Muturu	possible some left in S.E. Ghana	
Guinee-Bissau	Manjaca	West African Shorthorn	
Nigeria	Biu	taurine shorthorn bred out by Fulani zebu	
Cameroun	Bamiléké	taurine shorthorn	
Group 13			
Oman	Socotra	from Suqutrá island	
Malawi	Taurindicus	Tanganyika Shorthorn zebu × European	

Table S4. Cont.

Country	Breed	Remarks	Year/Period of Extinction (If Known)
Group 14			
South Africa	Ama-Xhosa	Nguni type; slaughter of complete Xosa cattle herd	1856
D.R. Congo	Wadai Dinka	Nilotic sanga type	
Zimbabwe	Pecanite	taurine shorthorn (possible European)	
Group 15			
California, USA	Californian cattle		mid 19th century
Jamaica	Creole Jamaicano	descending early Spanish import	
Costa Rica	Mysol	zebu × Criollo	
Ecuador	Costa Criollo: varieties El Oro and Esmeraldes		1970s
Venezuela	Ocampo	Brown Swiss × Criollo	
Uruguay	Colônia		
Brazil	Legítimo	Crioulo do Sul type	
	Mineiro	Crioulo do Sul type	
	Igarapé	dwarf type from São Paulo	
	Angola	possible from Portuguese colonial Angola	
	Guadamar	Ongole bulls × Curaleiro	
	Malabar	tracing zebu import since 1813 from Kerala, S.W. India	
	Nilo	presumed African descent, bred since 1826	
	Tatu	Red Sindhi or Sahiwal bulls × Crioulo	
	China	zebu, possible Red Sindhi bulls × Crioulo	
	Quinhentão	zebu, possible Red Sindhi bulls × Crioulo	
Group 16			
USA	Yellow Dane	Danish, late 18th century	
	Polled Albion	Breeding Society	late 19th century
	Single Standard	Herd Book 1894-1918, discontinued	
	Polled Shorthorn	after introduction of Double Standard	
	Single Standard	since 1893, BS 1900, discontinued after	
	Polled Hereford	introduction of Double Standard	
Brazil	Javanês	zebu bull × Crioulo, 19th century	
	Guzerando	Guzerá × Friesian	
	Suisbú	Swiss Brown × zebu	
	Indo-europeu leiteiro	zebu × taurine programme	
	Santa Gabriele	Red Pied Friesian, Devon × zebras	
Argentina	Tropicana	Guernsey × zebu	
	Tropical	Holstein × zebu	
	Tarquinos	Shorthorn × Criollo	
New Zealand	Campbell Island	feral European since 1902, clones from last cow alive	1990s

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