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Villars-sur-Glâne, 31.01.2021 | JB

## Drittmittel-Projekte, Publikationsliste und Betreuungsarbeit

### Drittmittel-Projekte als PI- oder Mitbewerber:

**Projekt:** From grassland biodiversity and grass conservation to the animal's microbial ecosystem and to milk and cheese quality. **Finanziert durch:** SmartCow TNA (2018). **Funding:** 432 cows-weeks equivalent to 60'000.- CHF.

**Projekt:** Dairy products as essential sources of iodine in the Swiss population: understanding iodine transfer into milk and milk products and its bioavailability in humans (MIOD). **Finanziert durch:** ETH Zürich World Food System Grants Platform (2015). **Funding:** 264'702.- CHF.

**Projekt:** Extensive Grazing on subalpine pastures: Integrating Biodiversity and the production of Meat with special quality (EG4BM). **Finanziert durch:** Mercator Research Program, ETH World Food System Center (2014). **Funding:** 190'000.- CHF.

**Projekt:** Defining sources, variability and bioavailability of iodine in milk and dairy products to ensure adequate iodine nutrition in the Swiss population. **Finanziert durch:** BLV grant (2014). **Funding:** 215'533.- CHF.

### Peer-reviewed journal-article (44+1)

#### 2021 (6)

MANZOCCHI E., FERLAY A., FARIZON Y., ENJALBERT F., BOUCHON M., GILLER K., KREUZER M., **BERARD J.**, MARTIN B., COPPA M. (2021) Herbage utilization method affects ruminal biohydrogenation of dietary fatty acids and milk fatty acid profile in Holstein and Montbéliarde cows. Journal of Dairy Science submitted

KAPP-BITTER A., **BERARD J.**, AMELCHANKA S.L., BAKI C., KUNZ C., STEINER A., KREUZER M., LEIBER F. (2021) Efficiency of small burnet, birdsfoot trefoil and plantain in limiting nitrogen losses by dairy cows in a low-concentrate feeding system Animal Nutrition Submitted

AKERT F.S., KREUZER M., KUNZ C., REIDY B., **BERARD J.** (2021) Effects of full-time v. part-time grazing on seasonal changes in milk coagulation properties and fatty acid composition Journal of Dairy Research , First View , pp. 1 - 6 <https://doi.org/10.1017/S0022029921000169>

MANZOCCHI E., MARTIN B., BORD C., VERDIER-METZ I., BOUCHON M., DE MARCHI M., CONSTANT I., GILLER K., KREUZER M., **BERARD J.**, MUSCI M., COPPA M. (2021) Feeding cows with hay, silage, or fresh herbage on pasture or indoors affects sensory properties and



chemical composition of milk and cheese. Journal of Dairy Science Vol 104 N. 5  
<https://doi.org/10.3168/jds.2020-19738>

SCHLEGEL P., WALTHER B., HALDIMANN M., **BERARD J.** (2021) Milch als Jodquelle: Fütterungsempfehlungen für einen sicheren Jodgehalt der Milch Agroscope Transfer Nr. 390 / 2021 DOI  
<https://doi.org/10.34776/at328g>

KREUZER M., PERVIER S., TURILLE G., KARPATCHEVA M., JULIUS N., OREILLER C.  
**BERARD J.** (2021) Beef quality in two autochthonous Valdostana breeds fattened in alpine transhumance: effect of lowland finishing and meat ageing. Italian Journal of Animal Science Vol. 20 Issue 1 Pages 267-278 <https://doi.org/10.1080/1828051X.2021.1882346>

KOCZURA M., MARTIN B., MUSCI M., DI MASSIMO M., BOUCHON M., TURILLE G., KREUZER M., **BÉRARD J.**, COPPA M. (2021) Little difference in milk fatty acid and terpene composition among three contrasting dairy breeds when grazing a biodiverse mountain pasture, Frontiers in Veterinary Science, section Animal Behavior and Welfare Vol. 7 Article 612504 Pages 1-11  
<https://doi.org/10.3389/fvets.2020.612504>

### 2020 (8 +1)

AKERT F. S., KREUZER M., HOFSTETTER P., **BERARD J.**, REIDY B. (2020) Nitrogen use efficiency, reticulo-ruminal pH and behaviour of lactating cows grazing either in a full-time system or in a part-time system with indoor feeding of fresh herbage and concentrate. Journal of Agricultural Science 158, 527–538. <https://doi.org/10.1017/S0021859620000891>

ZEHNDER T., LÜSCHER A., RITZMANN C., PAULER C.M., **BÉRARD J.**, KREUZER M., SCHNEIDER M. K. (2020) Dominant shrub species are a strong predictor of plant species diversity along sub-alpine pasture-shrub transects Alpine Botany <https://doi.org/10.1007/s00035-020-00241-8>

PAULER, C. M., ISSELSTEIN, J., **BÉRARD J.**, BRAUNBECK, T., SCHNEIDER, M. K. (2020). Grazing Allometry: Anatomy, Movement, and Foraging Behavior of Three Cattle Breeds of Different Productivity. Front. Vet. Sci., doi: 10.3389/fvets.2020.00494

PAULER, C. M., ISSELSTEIN, J., SUTER, M., BÉRARD J., BRAUNBECK, T., SCHNEIDER, M. K. (2020). Choosy grazers: Influence of plant traits on forage selection by three cattle breeds Functional Ecology Vol. 34, Issue 5 Pages 980-992 <https://doi.org/10.1111/1365-2435.13542>

(PAULER, C. M., ISSELSTEIN, J., SUTER, M., **BÉRARD J.**, BRAUNBECK, T., SCHNEIDER, M. K. & SKOU C. (2020). Selektive græssere. Highland Nyt, 2, 13-22)

AKERT F. S., DORN K., FREY H., HOFSTETTER P., **BERARD J.**, KREUZER M., REIDY B. (2020) Farm-gate nutrient balances of grassland-based milk production systems with full- or part-time grazing and fresh herbage indoor feeding at variable concentrate levels. Nutrient Cycling in Agroecosystems. DOI 10.1007/s10705-020-10072-y

WOLF C, GREDIG N, KREUZER M, ULRICH S E, **BÉRARD J.**, GILLER K (2020) Preferential Partitioning of Rumen-Protected n-3 and n-6 Fatty Acids into Functionally Different Adipose Tissues. Lipids Vol: 55 Pages: 239–250 DOI 10.1002/lipd.12233

CHIUMIA D, HANKELE AK, DREWS B, ZEHNDER T, **BÉRARD J.**, GIESBERTZ P, ULRICH SE, GILLER K (2020) Alpine and lowland grazing differentially alter the reproductive tract redox milieu and amino acid composition in cattle. Animal Reproduction Science. Vol.213, page/article: 106268 DOI: 10.1016/j.anireprosci.2019.106268

KOCZURA M, BOUCHON M, TURILLE G DE MARCHI M, KREUZER M, **BÉRARD J.**, MARTIN B



(2020) Consequences of walking or transport by truck on milk yield and quality, as well as blood metabolites, in Holstein, Montbéliarde, and Valdostana dairy cows. *Journal of Dairy Science* Vol. 103, Issue 4, Pages 3470–3478. DOI: 10.3168/jds.2019-17467

## 2019 (10)

GILLER K, GANGNAT I D M, SILACCI P, MESSADENE-CHELALI J, KREUZER M, **BÉRARD J**

(2019) Meat and carcass quality of Dexter cattle compared with that of suckler, Charolais-cross calves: a preliminary study. *Animal Production Science*, Vol. 59 Pages 986-992. DOI: 10.1071/AN17888

HANKELE A K , REHM K, **BÉRARD J**, SCHULER G, BIGLER L, ULRICH S E (2019) Progestogen profiling in plasma during the estrous cycle in cattle using an LC-MS based approach. *Theriogenology*, DOI: 10.1016/J.THERIOGENOLOGY.2019.10.005

KOCZURA M, MARTIN B, BOUCHON M, TURILLE G, **BÉRARD J**, FARRUGGIA A, KREUZER M, COPPA M (2019) Grazing behaviour of dairy cows on biodiverse mountain pastures is more influenced by slope than cow breed. *Animal*, Pages 1-9 DOI: 10.1017/S175173111900079X

KOCZURA M, MARTIN B, TURILLE G, DE MARCHI M, KREUZER M, **BÉRARD J** (2019) Milk composition, but not cheese properties, are impaired the day after transhumance to alpine pastures. *International Dairy Journal* Vol. 99 DOI: 10.1016/J.IDAIRYJ.2019.104540

MANZOCCHI E, KOCZURA M, COPPA M, TURILLE G, KREUZER M, **BÉRARD J** (2019) Grazing on Upland Pastures Part-Time Instead of Full-Time Affects the Feeding Behavior of Dairy Cows and Has Consequences on Milk Fatty Acid Profiles. *Animals*, Vol. 13, Issue 11. Pages 2594-2602  
DOI:10.3390/ANI9110908

VAN DER REIJDEN O, GALETTI V, BÜRKI S, ZEDER C, KRZYSTEK A, HALDIMANN M, **BÉRARD J** M, ZIMMERMANN M B, HERTER-AEBERLI I (2019) Iodine bioavailability from cow milk: a randomized, crossover balance study in healthy iodine-replete adults. *Am J Clin Nutr* Vol. 110 Pages 102-110. DOI:10.1093/AJCN/NQZ092

VAN DER REIJDEN O, GALETTI V, HERTER-AEBERLI I, ZIMMERMANN M L B, ZEDER C, KRZYSTEK A, HALDIMANN M, BARMAZ A, KREUZER M, SCHLEGEL P, **BÉRARD J.** (2019) Effects of feed iodine concentrations and milk processing on iodine concentrations of cows' milk and dairy products, and potential impact on iodine intake in Swiss adults. *British Journal of Nutrition*, Pages 1-14 DOI: 10.1017/S0007114519001041

WOLF C, GREDIG N, ULRICH S E, KREUZER M, **BÉRARD J**, GILLER K (2019) Partitioning of Rumen-Protected n-3 and n-6 Fatty Acids is Organ-Specific in Growing Angus Heifers. *Lipids*, Vol. 54 Pages 503-517. DOI: 10.1002/LIPD.12183

WOLF C, MESSADÈNE-CHELALI J, ULRICH S E, KREUZER M, GILLERA K, **BÉRARD J** (2019) Replacing sunflower oil by rumen-protected fish oil has only minor effects on the physico-chemical and sensory quality of Angus beef and beef patties. *Meat Science*, Vol. 154 Pages 109-118. DOI:10.1016/J.MEATSCI.2019.04.002

KOCZURA M, PERVIER S, MANZOCCHI E, TURILLE G, BRUCKMAIER R M, KREUZER M, **BÉRARD J** (2019) Previous alpine grazing experience of cows has little medium-term effect on feeding behaviour, milk yield and composition in a traditional alpine system. *Italian Journal of Animal Science*. DOI: 10.1080/1828051X.2018.1532326



## 2018 (6)

GILLER K, DREWS B, **BÉRARD J**, KIENBERGER H, SCHMICKE M, FRANK J, SPANIER B, DANIEL H, GEISSLINGER G, ULRICH S E (2018) Bovine embryo elongation is altered due to maternal fatty acid supplementation *Biology of Reproduction*, 99(3), 600-610. DOI: 10.1093/BIOLRE/IOY084

HOLINGER M, FRÜH B, STOLL P, PEDAN V, KREUZER M, **BÉRARD J**, HILLMANN E (2018) Long-term effects of castration, chronic intermittent social stress, provision of grass silage and their interactions on performance and meat and adipose tissue properties in growing-finishing pigs *Meat Science* Volume 145, Pages 40-50. DOI: 10.1016/J.MEATSCI.2018.05.018

NIERO G, KOČZURA M, DE MARCHI M, CURRÒ S, KREUZER M, TURILLE G, **BÉRARD J** (2018) Are cheese-making properties of dual purpose cattle impaired by highland grazing? A case study using Aosta Red Pied cows. *Italian Journal of Animal Science*. DOI: 10.1080/1828051X.2018.1443289

NIERO G, PENASA M, **BÉRARD J**, KREUZER M, CASSANDRO M, DE MARCHI M (2018) Technical note: Development and validation of an HPLC method for the quantification of tocopherols in different types of commercial cow milk *J. Dairy Sci.* 101:6866–6871 DOI: 10.3168/JDS.2017-14187

VAN DER REIJDEN O, GALETTI V, HULMANN M, KRZYSTEK A, HALDIMANN M, SCHLEGEL, MANZOCCHI E, **BÉRARD J**, KREUZER M, ZIMMERMANN M B, HERTER-AEBERLI I (2018) The main determinants of iodine in cows' milk in Switzerland are farm type, season and teat dipping. *British Journal of Nutrition* 119, 559-569. DOI: 10.1017/S0007114517003798

WOLF C, ULRICH S E, KREUZER M, **BÉRARD J**, GILLER K (2018) Differential partitioning of rumen-protected n-3 and n-6 fatty acids into muscles with different metabolism. *Meat Science* Volume 137, Pages 106-113. DOI: 10.1016/J.MEATSCI.2017.11.007

## 2017 (2)

GANGNAT I D M, LEIBER F, DUFÉY P-A, SILACCI P, KREUZER M, **BÉRARD J** (2017) Physical activity, forced by steep pastures, affects muscle characteristics and meat quality of suckling beef calves. *J. Agric. Sci.* 155, 348-359. DOI: 10.1017/S0021859616000848

GANGNAT I D M, DUFÉY P-A, SILACCI P, MESSADENE-CHELALI J, KREUZER M, **BÉRARD J** (2017) Effect of nursing or mentoring by adult cows on physical activity, performance and meat quality of fattening beef calves kept on alpine pastures. *J. Sci. Food Agric.* 97, 2741-2749. DOI: 10.1002/JSFA.8101

## 2016 (1)

GANGNAT I D M, KREUZER M, CLAVIJO MCCORMICK A, LEIBER F, **BÉRARD J** (2016) Carcass and meat quality of finished and non-finished Limousin heifers from alpine livestock systems differing in altitudinal origin of the forage. *Archives of animal nutrition* 70, pp. 108-126. DOI:10.1080/1745039X.2015.1134398

## 2013 (3)

KALBE C, **BÉRARD J**, PORM M, REHFELDT C, BEE G (2013) Maternal L-arginine supplementation during early gestation affects foetal skeletal myogenesis in pigs. *Livestock Science* Volume 157, pp. 322–329. DOI: 10.1016/J.LIVSCI.2013.06.016



PARDO C E, MÜLLER S, **BÉRARD J**, KREUZER M, BEE G (2013) Importance of average litter weight and individual birth weight for early postnatal performance and myofiber characteristics of progeny. *Livestock Science* Volume 157, pp. 330–338. DOI: 10.1016/J.LIVSCI.2013.06.015

PARDO C E, **BÉRARD J**, KREUZER M, BEE G (2013) Intrauterine crowding impairs formation and growth of secondary myofibers in pigs. *Animal* Volume 7, Issue 3, pp. 430-438.  
DOI:10.1017/S1751731112001802

## 2011 (2)

**BÉRARD J**, KALBE C, LÖSEL D, TUCHSCHERER A, REHFELDT C (2011) Potential sources of early-postnatal increase in myofibre number in pig skeletal muscle. *Histochemistry and Cell Biology*. Volume 136, Issue 2, pp. 217-225. DOI: 10.1007/S00418-011-0833-Z

GONDRET F, PERRUCHOT M H, TACHER S, **BÉRARD J**, BEE G (2011) Differential gene expressions in subcutaneous adipose tissue pointed to a delayed adipocytic differentiation in small pig foetuses compared to their heavier siblings. *Differentiation*, Volume 81, Issue 4, pp. 253-260.  
DOI:10.1016/J.DIFF.2011.02.002

## 2010 (3)

**BÉRARD J**, BEE G (2010) Effects of dietary L-arginine supplementation to gilts during early gestation on foetal survival, growth and myofiber formation. *Animal*, Volume 4, Issue 10, pp. 1680-1687. DOI: 10.1017/S1751731110000881

**BÉRARD J**, PARDO C E, BÉTHAZ S, KREUZER M, BEE G (2010) Intrauterine crowding decreases average birth weight and impairs muscle hyperplasia in piglets. *Journal of Animal Science*, Volume 88, pp. 3242-3250. DOI: 10.2527/JAS.2010-2867

**BÉRARD J**, KREUZER M, BEE G (2010) In large litters birth weight and gender are decisive for growth performance but less for carcass and pork quality traits. *Meat Science*, Volume 86, Issue 3, pp. 845-851. DOI: 10.1016/J.MEATSCI.2010.07.007

## 2008 (1)

**BÉRARD J**, KREUZER M, BEE G (2008) Effect of litter size and birth weight on growth, carcass and pork quality, and their relationship to postmortem proteolysis. *Journal of Animal Science* Volume 86, pp. 2357-2368. DOI: 10.2527/JAS.2008-0893

## 2007 (1)

**BÉRARD J**, BIANCHI F, CARERI M, CHATEL A, MANGIA A, MUSCI M (2007) Characterization of the volatile fraction and of free fatty acids of “Fontina Valle d'Aosta”, a protected designation of origin Italian cheese *Food Chemistry*, Volume 105, Issue 1, pp. 293-300. DOI: 10.1016/J.FOOD-CHEM.2006.11.041

## Promotionsarbeit (1)



Dr. sc. ETH **Berard Joel** (2009) The effects of prenatal events on fetal development, growth performance and carcass quality in pigs. Thesis, Diss ETH No 18755. Defended November 30th 2009. Printed 2010. ETH Zurich.

## Betreuungsarbeit (23)

### Promotionsarbeit (7)

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di: **Steve Pervier**, intitolata: Effect of alpine farming systems and pasture environment on animal well-being, adaptation capacity and milk/milking characteristic of primiparous and multiparous Aosta Red Pied cows. *In process.* 21.11.2013 - open ETH Zürich

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di **Tobias Zehnder**: Extensive grazing on subalpine pastures: Integrating biodiversity and the production of meat with special quality. *In process.* 02.10.2014 - open ETH Zürich

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di **Madeline Koczura** Intake, behavior and performance of robust indigenous cow breeds in transhumant and low input mountain dairy production systems, and the consequences for milk and cheese quality. *Abgeschlossen* (2019). 19.5.2016 -28.01.2019 ETH Zürich DOI: 10.3929/ethz-b-000335794

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di **Olivia van der Reijden** Defining sources, variability and bioavailability of iodine in milk and dairy products to ensure adequate iodine nutrition in the Swiss population. *Abgeschlossen* (2019). 01.11.2014 - 31.01.2019 ETH Zürich DOI:10.3929/ethz-b-000355526

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di **Christina Wolf** Novel products of rumen-protected very long chain omega-3 fatty acids: In vivo and in vitro assessment of rumen stability and efficiency to enhance these fatty acids in different body tissues. *Abgeschlossen* (2019). 22.10.2015 -14.01.2019 ETH Zürich DOI: 10.3929/ethz-b-000356516

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di **Franziska Akert** Resource efficiency and milk quality of grassland-based milk production systems as affected by feeding and breed. *Abgeschlossen* (2018). 19.11.2014 - 01.10.2018 ETH Zürich DOI: 10.3929/ethz-b-000329017

Supervisore e co-esaminatore della tesi di Dottorato del Politecnico di Zurigo ETHZ di **Isabelle Gangnat**: Effect of lowland and highland diet and physical activity on growth performance, carcass quality and muscle metabolism in beef cattle. *Abgeschlossen* (2015). 05.04.2012 - 25.02.2015 ETH Zürich DOI: 10.3929/ethz-a-010432448

### Masterarbeit (6)

Supervisore e co-esaminatore della tesi di Master del Politecnico di Zurigo ETHZ di **Marie Hulmann** Investigating origin of the iodine variability in milk from different farms throughout Switzerland – an observational study *Abgeschlossen* (2016). 01.05.2016 - 31.10.2016 ETH Zürich

Supervisore e co-esaminatore della tesi di Master del Politecnico di Zurigo ETHZ di **Louisa Sarakinis** Bedeutung der Schlachttierkategorie Jungkühe (RV) für den Schweizer Markt: wirtschaftliche und fleischqualitative Aspekte. *Abgeschlossen* (2017). 08.08.2016 - 01.03.2017 ETH Zürich

Supervisore e co-esaminatore della tesi di Master del Politecnico di Zurigo ETHZ di **Nadine Herrmann**



## Drittmittel-Projekte, Publikationsliste und Betreuungsarbeit

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How, and to which extend, is alpine transhumance affecting the cow's feeding behavior, milk and cheese properties? *Abgeschlossen (2016). 13.06.2016 - 02.12.2016 ETH Zürich*

Supervisore e co-esaminatore della tesi di Master del Politecnico di Zurigo ETHZ di **Maria Karpat-cheva**. Effect of grass-based diets and meat aging on physicochemical properties in meat of dual-purpose cow breeds and consumer acceptance of these products *Abgeschlossen (2016). 28.09.2015 – 31.10.2016 ETH Zürich*

Supervisore e co-esaminatore della tesi di Master del Université de Lorraine di **Madeline Koczura** Comparison of two alpine farming system: the open air breeding system does increase the ingestion time of Aosta red pied cows, but without affecting milk composition, the main milking characteristics or coagulation proprieties. *Abgeschlossen (2015). 01.03.2015 -30.08.2015 Université de Lorraine*

Supervisore e co-esaminatore della tesi di Master del Wageningen University di: **Dora Flament**: Effect of physical activity on muscle metabolism and meat quality in suckling calves. *Abgeschlossen (2014). 10.06.2013- 20.12.2013 Wageningen University*

### Bachelorarbeit (8)

Supervisore e esaminatore della tesi di Bachelor del Politecnico di Zurigo ETHZ di **Christian Jeantet** Composizione acidica del grasso del latte prodotto da bovine di razza valdostana *Abgeschlossen (2019). 01.10.2019 - 30.11.2019 Università degli studi di Torino*

Supervisore e esaminatore della tesi di Bachelor del Politecnico di Zurigo ETHZ di **Tiago Ernst** Extensive grazing on subalpine pastures: effects on the fatty acid profile in the meat of robust sheep and cattle breeds *Abgeschlossen (2017). 26.01.2017 30.06.2017 ETH Zürich*

Supervisore e co-esaminatore della tesi di Bachelor del Politecnico di Zurigo ETHZ di **Sarah Bregant** Assessing of the effect of iodine concentrations in feed and dairy processing on iodine concentration in dairy products. *Abgeschlossen (2016). ETH Zürich*

Supervisore e co-esaminatore della tesi di Bachelor dell' Università degli studi di Torino di **Arianna Jeantet** Effect of pasture environment on milk fatty acids profile of multiparous Aosta Red Pied cows. *Abgeschlossen (2016). 01.10.2016 - 30.11.2016 Università degli studi di Torino*

Supervisore della tesi di Bachelor e responsabile scientifico di: **Yvette Noro** Characterization of the volatile fraction of dual-purpose cow breeds fat tissue on grass-based diets. *Abgeschlossen (2016). Università degli studi di Parma*

Supervisore e esaminatore della tesi di Bachelor del Politecnico di Zurigo ETHZ **Elisa Manzocchi** Alpine environmental and animal-based effects on nutritional quality of milk of Aosta Red Pied cows. *Abgeschlossen (2015). 01.04.2015 - 30.06.2015 ETH Zürich*

Supervisore e esaminatore della tesi di Bachelor del Politecnico di Zurigo ETHZ di: **Christine Letsch** Lowland and alpine milk: Investigations to their contribution of the supply of the population with iodine and dietetically desired fatty acids. *Abgeschlossen (2014). 30.01.2014 - 30.07.2014 ETH Zürich*

Supervisore e co-esaminatore della tesi di Bachelor del Université de Toulouse di: **Léa Goiset** Alpine farming systems with or without barn: Study of the influence of the physiological parameters and milk/milking characteristics of primiparous Aosta Red Pied cows. *Abgeschlossen (2013). 01.03.2013 - 18.07.2013 Université de Toulouse*

### Maturaarbeit (1)



**Christian Jeantet** La carne delle razze valdostane: un prodotto da valorizzare. Institute Agricole Aosta. *Abgeschlossen (2016)*.

## Veterinarian postgraduate thesis (1)

**Stefania Zanino** Effect of different alpine farming systems on milking characteristics and milk composition on Aosta Red Pied cows. *Abgeschlossen (2013)*.