# a

Koexistenz

fsai'

Design for Farmed Species

In recent years, young architects in Switzerland have become increasingly aware of the relations between agriculture – in particular animal farming – and the global climate and biodiversity crises. Protest movements such as Fridays for Future or Klimastreik demonstrate the collective recognition that a major overhaul of agricultural practices is necessary. Numerous *Volksinitiativen*, for example the upcoming *Pestizid-Initiative*[1] or the pending *Massentierhaltungsinitiative*[2] are steps in the right direction. These changes adress ethical questions about how we coexist with our farmed species. What role can architects play in designing agricultural territories and structures for farmed species?

AUTHORS   Dorothee Hahn and Jan Westerheide

The living conditions of farmed animals stay mostly invisible to us humans.
(Photo: Lara Biesser)
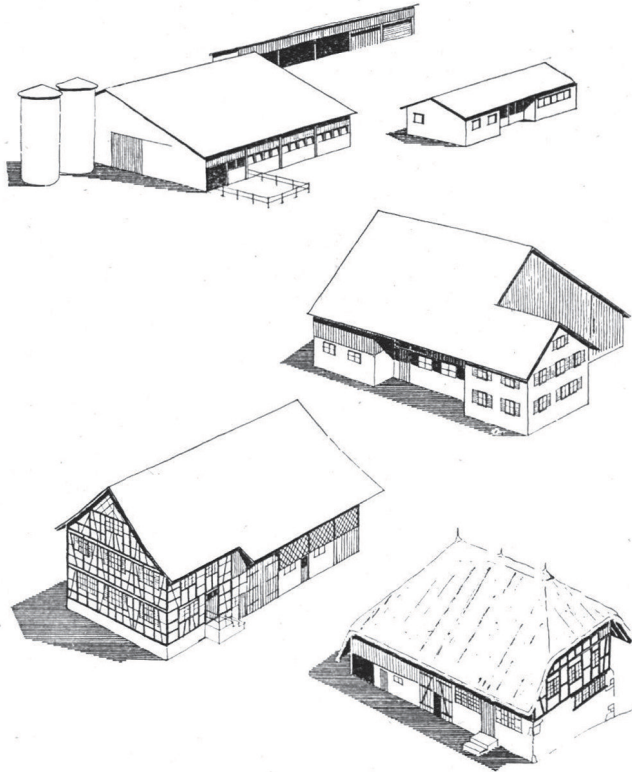
From bottom to top: Transformation of farm buildings, from the Hochstudhaus with coexistence of human and farmed animals to separated structures due to larger machinery and livestock numbers.
(Illustration: Schweizer Heimatschutz, 1962)

Examining Swiss architectural history, it appears that architects have rarely engaged in the design challenges offered by architecture for agriculture. Farm buildings were traditionally vernacular in design and constructed by carpenters, having been refined and adapted over centuries. With the industrialization of agriculture in the 19th and 20th centuries, fertilizers, crop rotation techniques, and later property consolidation, mechanization and new breeding techniques, began to change the agricultural landscapes and their facilities profoundly.[3] The traditional farm building – where humans and farmed species lived under one roof – became outdated as the number of livestock per farm increased and new machinery required additional space, both within and between buildings. Instead of extending existing structures, the new designs aimed at new, rationalized typologies where the individual structures – dwelling house, barn and outbuildings – were separated according to their function. On the international architectural scene, Hugo Häring's Gut Garkau (Scharbeutz, 1926) or Le Corbusier's *Ferme radieuse* concept (1938) demonstrate the application of modern architecture to the rural realm. Back in Switzerland, the private alliance SVIL (Schweizer Vereinigung für Innenkolonisation und industrielle Landwirtschaft)[4] became an important driver of transformation of agricultural facilities after the Second World War through standardization and functionalist design: Between 1960 and 1968, the SVIL architects, agronomists and planners were responsible for constructing around 140 standardized stables in Switzerland.[5]

Rationalization of agricultural facilities by specialists in the postwar decades and increasing price pressure on farmers throughout the past century have paved the

1   Bundesamt für Landwirtschaft (BLW), "Initiative 'Für eine Schweiz ohne synthetische Pestizide'," April 15, 2021, on: bk.admin.ch

2   Bundeskanzlei (BK), "Eidgenössische Volksinitiative 'Keine Massentierhaltung in der Schweiz (Massentierhaltungsinitiative)'," March 23, 2021, on: bk.admin.ch.

3   Anne-Marie Rachoud-Schneider, "Landwirtschaft," in: *Historisches Lexikon der Schweiz HLS*, November 19, 2007, on: hls-dhs-dss.ch

4   SVIL was founded in 1918 through a private initiative under the impact of the wartime supply crisis. Under managing director Hans Bernhard's influence, it developed in the 1920s and 1930s into a quasi-governmental agricultural planning agency. Bernhard wanted to counter the decline in agricultural self-sufficiency caused by industrialization with a radical increase in internal colonization – not against industry, but in cooperation with it. SVIL advanced these ideas through wasteland development projects, industrial housing estates, farming settlements and resettlement projects, among other undertakings. See Pietro Morandi, "Hans Bernhard," in: *Historisches Lexikon der Schweiz HLS*, July 2, 2002, on: hls-dhs-dss.ch

5   Buolf Vital, "Gedanken zur Weiterentwicklung des landwirtschaftlichen Bauens," in: *Schweizerische Bauzeitung* 90, 1972, p. 1344.

way for faster and cheaper buildings, today delivered by commercial companies.[6] Their prefabricated building systems meet the needs of farmers whose facilities are getting bigger, with larger machinery and stricter animal welfare regulations that require more space.[7]

In this trajectory, to date, architects have seldom designed spaces for farmed species. Hence, the complex field of animal farming, which involves urgent matters of animal welfare, biodiversity, or climate, has become an exclusive domain of engineering and other specialists — a construction without design.

## THE PARADIGM OF FOOD SELF-SUFFICIENCY AND THE INTENSIFICATION OF AGRICULTURE

Since the 1940s, Switzerland has been committed to ensuring the abundance of food through increasingly efficient production.[8] The concept of a self-sufficient food supply – nourished by the fear of shortages going back to the Second World War – has driven the broad processes of modernization and industrialization of the Swiss countryside. An increase in yield was made possible through radical interventions in the landscape, so-called meliorations, which have included extensive drainage of wetlands and the establishment of an efficient network of roads and paths at the expense of

ecologically valuable landscapes and biodiversity. When, in 1987, following the acceptance of the Rothenthurm Initiative, the protection of moors and wetlands was included in the Swiss federal constitution,[9] more than 90 percent of all wetland habitats and a large part of their biodiversity had already vanished.[10] The state introduced diverse regulative tools throughout the last century – such as land use and policy reforms, ranging from the *Plan Wahlen* program presented in 1940 to the *FFF Sachplan* (*Fruchtfolgeflächen*) introduced in 1992 – to enable intensification in agriculture. Additionally, market-regulating tools were applied: First, heavy price supports between the 1950s and the 1980s, and later, direct payments that today make up to 54 percent of the gross income of all farming in Switzerland.[11]

After the Second World War, the demand for animal foods like meat, fish and dairy products increased along with rising living standards. The growing influence of large retailers such as *Coop* and *Migros* and globalization of trade have continued to drive food prices down, putting farmers under increasing pressure. As a result, many livestock farmers in Switzerland have already opted to intensify their production since decades. A common response to the productivity pressure has been an increase in livestock numbers. This is particularly striking in chicken farming, where around

Construction of the Giessen, a new channel between Altdorf and Flüelen, as part of the melioraton of the Reuss plain between 1919-1925.
(Photo: PD)
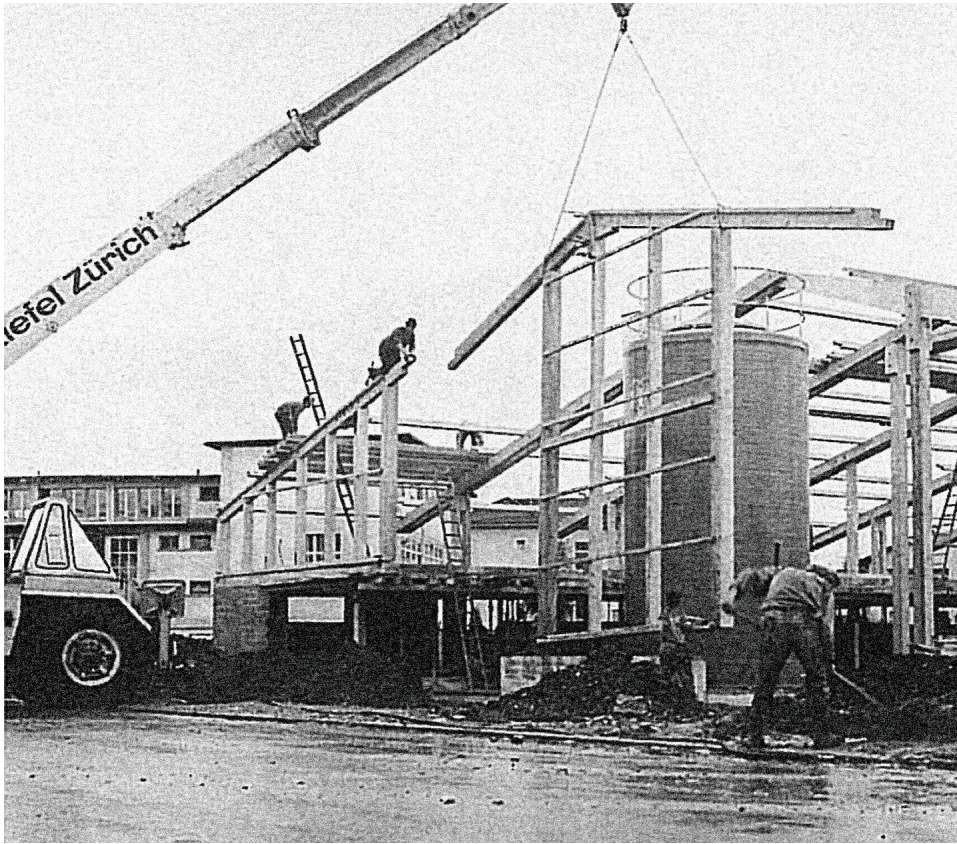
Rapid-Hof in Dietikon, 1969. Standardization by construction companies resulted in faster and cheaper farm architecture that can easily be expanded. (Photo: SVIL)

900 chickens live on a farm today, compared to 128 in 1975.[12] Other techniques used to enhance productivity include breeding and medical monitoring. In 2019, an average dairy cow in Switzerland produced roughly twice as much milk compared to 1970.[13] The increase in productivity through breeding is accompanied by extreme physical changes: As Markus Gerber, president of the breeders' association *Swissherdbook*, points out, the average size of cows increases 0.3 centimeters per year.[14] Thus inside stables built 25–30 years ago, space has become tight.

Such improved efficiency enabled Switzerland to boast close to 100 percent self-sufficiency in animal products[15] – which is astonishing, despite shrinking agricultural areas and growing expansion of settlements. But intensification has not been the only path taken in the agricultural industry. Some farmers have sought to produce under organic labels like *Bio Knospe* or *Demeter*, whereby animals are kept in a sustainable way, both ecologically[16] and ethically. This allows farmers to receive direct payments and achieve higher prices than those for conventional products in accordance with the

6   Agroscope FAT Tänikon, "Landwirtschaftliches Bauen und Landschaft (BAULA)," *FAT-Schriftenreihe* 69, April 1, 2006, on: architekturbibliothek.ch

7   See "Stiftung Landschaftsschutz zeigt, wie Ställe besser in die Landschaft passen," in: *Luzerner Zeitung*, March 13, 2020, on: luzernerzeitung.ch; and Rahel Marti, "Bauer sucht... Architektin," in: *Hochparterre*, March 16, 2020, on: hochparterre.ch.

8   Werner Baumann / Peter Moser, "Agrarpolitik," in: *Historisches Lexikon der Schweiz*, August 16, 2012, on: hls-dhs-dss.ch. On the current situation, see Bundesamt für Landwirtschaft (BLW), "Botschaft zur Weiterentwicklung der Agrarpolitik ab 2022 (AP22+)," *Bundesblatt* BBl 2020 3955, May 22, 2020, on: fedlex.data.admin.ch, p. 3957.

9   Bundeskanzlei (BK), "Eidgenössische Volksinitiative 'zum Schutz der Moore – Rothenthurm-Initiative'," on: bk.admin.ch

10 Matthias Bürgi / Martin Stuber, *Vom 'Eroberten Land' zum Renaturierungsprojekt. Geschichte der Feuchtgebiete in der Schweiz seit 1700*, Bern 2019, (*Bristol Schriftenreihe*, 59).

11 Jennifer Anthamatten / Patrick Dümmler, "Weiterhin wachsende Kosten der Landwirtschaft," January 3, 2020, on: avenir-suisse.ch

12 Michael Graber, "In der Schweiz gab es 2019 so viele Hühner wie noch nie zuvor," in: *Luzerner Zeitung*, February 2, 2021, on: luzernerzeitung.ch

13 Schweizerisches Bauernsekretariat, "Milchstatistik der Schweiz 1970," August 1971, on: sbv-usp.ch; and "Durchschnittliche Milchleistung pro Kuh in der Schweiz im Jahr 1998 und 2019 (in kg)," August 2020, on: de.statista.com

14 Christiane Oelrich, "Die Schweizer Kühe werden zu dick für den Stall," in: *Welt*, August 13, 2018, on: welt.de

15 "Selbstversorgungsgrad," in: *Agrarbericht 2020*, on: agrarbericht.ch.

16 Frank Eyhorn / et al., "Sustainability in Global Agriculture Driven by Organic Farming," in: *Nature Sustainability* 2, 2019, pp. 253–255.
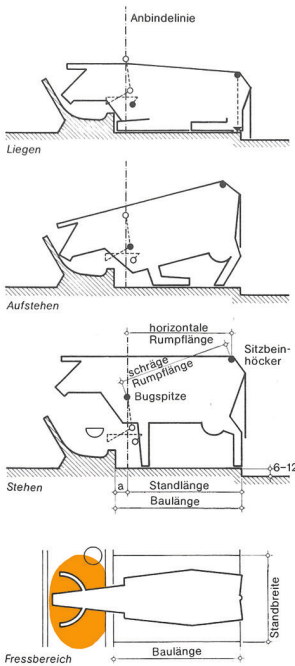
Left   Is this how we see a cow?
(Illustration: Fischer, Hilty, Stuber: *Bauen in der Landwirtschaft*, 1976)

Right   Normbergstall, 1967
Productivity pressure led to larger numbers of animals and optimized, expandable architectures.
(Illustration: Buolf Vital / SVIL)
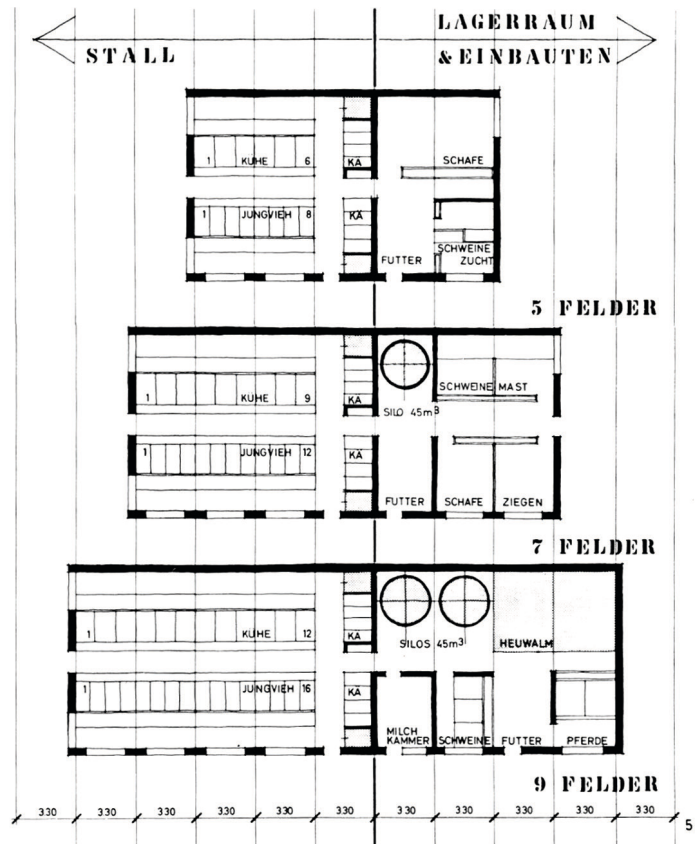
minimum standards of the Swiss *Tierschutzgesetz* (Animal Welfare Act).[17] In 2019, the market share of organic products was 10.3 percent and the trend is increasing.[18] Other farmers opt for niche products and/or operational diversification, for example tourism or gastronomy, but many farmers have also given up their profession, as revealed by the strong decline (75 percent) in farms since the 1950s.[19]
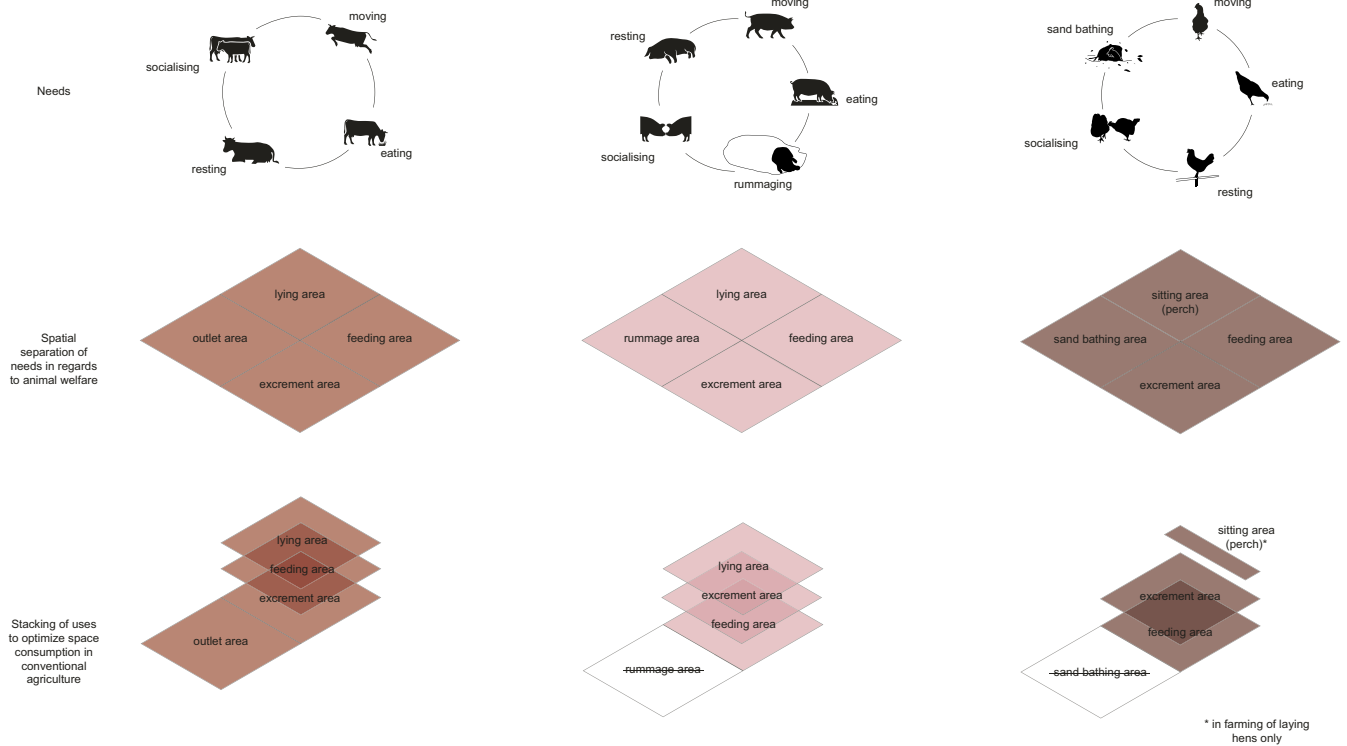
MINIMAL ANIMAL WELFARE

As production intensified, buildings for cows, pigs and chickens had to change and adapt. In conventional production, the space allocated to animals has been optimized in highly controlled environments, environments, which are largely invisible and isolated from human contact. These practices correspond to the requirements for husbandry prescribed by the *Tierschutzgesetz* introduced in 1981. This law was the outcome of decades of animal activism mobilized by the animal welfare

organizations, who campaigned for broadening the animal welfare agenda, which had hitherto been limited only to the prevention of animal cruelty. The law, whose purpose it is "to protect the dignity and welfare of animals,"[20] marked a crucial step for animal well-being. Yet the spaces allocated to farmed animals still seem to be too small to meet animals' needs: for example, the space allocated to a pig weighing up to 110 kilograms is currently 0.9 square meters in Switzerland: Only 0.15 square meters larger than in the EU[21] and thus often cited as a progressive solution. But one wonders: If ten pigs can legally be kept in an area smaller than an average parking space, does the law really ensure sufficient space for farmed species and their needs? Furthermore in attempting to transcend the human/nonhuman divide, how can the needs of animals be accurately assessed at all?
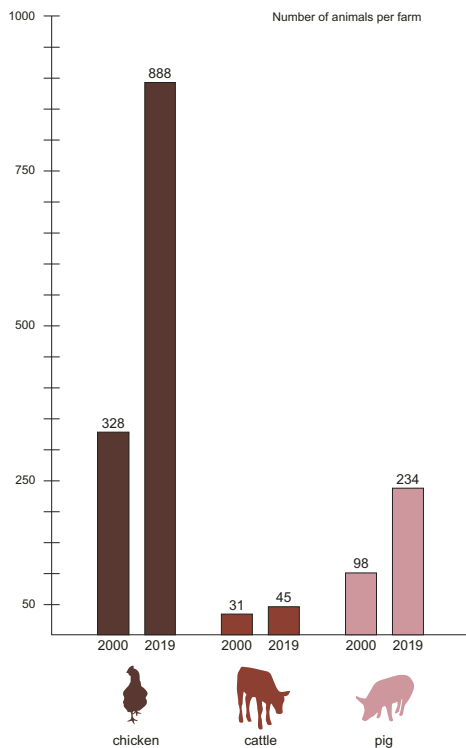
Among the undesired consequences of the minimum spatial provisions under the *Tierschutzgesetz* is the "stacking" of the animals' activities – resting, moving,

17   Flurin Maissen, "Tierhaltung: Macht Bio Tiere glücklich?", October 20, 2015, on: srf.ch

18   Bio Suisse, "Bio knackt beim Marktanteil die 10 Prozent-Hürde," May 6, 2020, on: www.bio-suisse.ch

19   "Betriebe," in: *Agrarbericht 2020*, on: agrarbericht.ch

20   See Tierschutzgesetz (TSchG), Chapter 1, Art. 1: "Zweck dieses Gesetzes ist es, die Würde und das Wohlergehen des Tieres zu schützen."

21   Jacqueline Büchi / Leo Helfenberger, "Und jetzt rate mal, wie viel Platz ein Schwein in einem EU-Stall hat," in *watson*, August 14, 2018, on: watson.ch

22   Bundesanstalt für Landwirtschaft und Ernährung (BLE), "Das Verhalten des Schweins," on: oekolandbau.de

Needs

socialising · moving · eating · resting

Spatial separation of needs in regards to animal welfare

lying area · outlet area · feeding area · excrement area

lying area · rummage area · feeding area · excrement area

sitting area (perch) · sand bathing area · feeding area · excrement area

Stacking of uses to optimize space consumption in conventional agriculture

lying area · feeding area · excrement area · outlet area

lying area · excrement area · feeding area · rummage area

sitting area (perch)* · excrement area · feeding area · sand bathing area

* in farming of laying hens only

Top   Animal welfare and space: Through the stacking of the animal's activities in conventional agriculture the animal's needs cannot fully be met.

Bottom   Intensification through the increase in livestock: An increase in animals per farm necessitates adapting the design of farming facilities.
(Illustrations: Lara Biesser and Ella Willemse, © ETH Architecture of Territory)

Number of animals per farm

chicken: 2000 – 328, 2019 – 888
cattle: 2000 – 31, 2019 – 45
pig: 2000 – 98, 2019 – 234

playing, eating and defecating all unfold in the same space. As ethologists have pointed out, pigs, for example, like to wallow in mud to cool down, because they do not have sweat glands, but they usually do not have access to moist earth to do so.[22] Scientific research shows that pigs are pronounced family animals; mothers and daughters have an especially close relationship throughout their lives. However, in conventional husbandry these familial ties are regularly broken and animals are separated from their kin.

In the 1990s, voluntary animal welfare programs, the so-called *Ethoprogramm RAUS* – a program focusing on outlet areas – and *BTS (Besonders tierfreundliche Stallhaltungssysteme)*, were introduced by the state in an attempt to achieve higher standards of animal welfare in livestock farming. Like other labels such as *IP-Suisse* or *Bio Suisse*, these programs have not been mandatory for farmers: Those who choose to follow them receive additional subsidies and can sell their products at a higher price. The problem with these programs is not only that they are optional, in addition, due to the minimal benefit for farmers, the distribution of breeds profiting from subsidies is uneven. Among fattened chickens, which constitute 64 percent of all commercial chicken populations, 2019 figures show only 8 percent profited

Schlachthof Zürich, 1993.
(Photo: Peter Morf © Baugeschichtliches Archiv, Stadt Zürich)

from *RAUS*, compared to 82 percent for laying hens.[23] The failure to promote sufficient and adequate outdoor spaces for certain breeds through subsidies translates today in the nearly complete absence of these animals from the Swiss landscape: nearly 6.5 million meat chickens, around 680 000 pigs and 425 000 fattening calves have vanished behind the confines of commercial farms in Switzerland.[24]

CLAIMING SPACES FOR ALL FARMED SPECIES

Science maintains that living beings can display their natural behavior only if their living conditions replicate key features of their habitat, with the necessary space and provisions. There cannot be too much space in terms of welfare – but environmental scientists claim that as the amount of land used by animals increases, emissions grow.[25] Animal husbandry in Switzerland is responsible for approximately 85 percent of agricultural greenhouse gas emissions.[26] Rethinking the current norms for the spaces allocated to our farmed cohabitants goes hand in hand with the assessment of the ecological impact of farming practices.

As architects, we can contribute by designing spaces for animals with the same care for the needs of the animal inhabitants as we do for the spaces we design for ourselves. This means that we first have to acquire knowledge about the needs of our farmed species. We also have to understand the needs of farmers, in order to propose alternative operational concepts that free farmers from the cost-pressure dilemma and allow them to realize spaces that secure the animals' welfare and are ecologically sensible. Finally, we have to take into account the complex ecological entanglements of husbandry, such as greenhouse gas emissions or nitrate accumulation in soils and waters. The findings of

23 Aviforum, "Eier- und Geflügelmarkt 2019: Inlandproduktion, Importe, Konsum, Tierbestände," October 6, 2020, on: aviforum.ch

24 Aviforum, "Geflügelwirtschaft in Zahlen (aktualisiert 10/20)," on: aviforum.ch

25 Lukas Emmenegger / et al., "Ammoniak-Emissionen von Milchviehlaufställen mit Laufhof: Im Winter weniger Verluste," in: *ART-Bericht* 745, May, 2011, p. 2; Amano Tatsuya / et al., "The Environmental Costs and Benefits of High-Yield Farming," in: *Nature Sustainability* 1, September 14, 2018, pp. 477–485; Martina Alig / et al., "Ökobilanz verschiedener Fleischprodukte: Geflügel- Schweine- und Rindfleisch," in: *Schlussbericht Projekt "EnviMeat"*, December 2016, p. 49.

26 Christof Ammann / et al., "Reduktionspotenziale von Treibhausgasemissionen aus der Schweizer Nutztierhaltung," in: *Agrarforschung Schweiz* 9 (11–12), November 2018, pp. 376–383

27 Agroecology Knowledge Hub, "Overview," on: fao.org

28 Donna J. Haraway, *Staying with the Trouble. Making Kin in the Chthulucene*, Durham NC 2016, p. 102.

29 Technische Universität München, "Animal-Aided Design: Bauen für Mensch und Tier," March 25, 2015, on: tum.de

30 See "Cohabitation Podcast," on: cohabitation-podcast.ch

31 See "Towards an Animalesque City – Visions for Human/Animal Cohabitation – Call for Short Movies," on: aaschool.ac.uk

agroecologists, who apply ecological concepts and principles to optimize interactions between plants, animals, humans and the environment,[27] are a valuable source of knowledge for this purpose.

MAKING KIN IN AGRICULTURE

Anthropologist Donna Haraway, one of the leading voices in the debates on the alternatives of the Anthropocene, issued a call to "make kin, not babies"[28] – a plea for new modes of co-existence across species. Haraway's arguments and those of similar thinkers are finally gaining momentum in architecture and urban design in Europe. Numerous recent projects explore design for coexistence, such as the animal-aided design (AAD) research project of TU Munich and the University of Kassel,[29] the *Cohabitation Podcast* by architect Jakob Walter,[30] and the *Animalesque Visiting School Competition* of the Architectural Association (AA),[31] to name but a few.

Still, design for farmed animals seems to be a blind spot. Architects can contribute by designing spaces and habitats that secure the animals' existence, improve their welfare, and promote biodiversity. Making farm animals visible in the landscape will be a first crucial step to involve the public and inform design agendas. Ultimately, design in animal farming is an opportunity for a more diverse landscape beyond human-centered territories, where we and our nonhuman cohabitants can coexist.

This article is based on the research and design studio New Ecologies – Soil, Water, Labour carried out by the chair of Architecture and Territorial Planning at ETH Zurich led by Professor Milica Topalović, in 2020. Dedicated to architecture beyond-the-human, the studio explored agriculture in the metropolitan region of Zurich.

Jan Westerheide *studied architecture at the ETH Zurich and at CEPT University in Ahmedabad. He worked at Soppelsa Architekten in Zurich, the chair of Kees Christiaanse at ETH and at ARCH+ in Berlin. Since February 2019, he has worked as a research and teaching assistant at the chair of Architecture and Territorial Planning at ETH Zurich.*

Dorothee Hahn *is an architect, editor and curator working between Zurich and Berlin. Since completing her studies in architecture at TU Berlin and ETH Zurich, she has focused on writing, editing and exhibiting both as a fellow at ARCH+ and collaborating with Brandlhuber+. Since 2020, she has worked as a research and teaching assistant at the the chair of Architecture and Territorial Planning at ETH Zurich.*