

# GOOD PRACTICE FOR NIGHT PENS ON ALPINE SUMMER PASTURES

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## 1. Introduction

Night enclosures for small livestock have a long tradition in many countries. Their use is still widespread, with flocks in many regions fenced or corralled during the night and accompanied by shepherds during the day for grazing (Haid, 2010). Night-time fencing serves both to control and to protect animals, although publications and studies often focus on only one aspect (Meuret and Provenza, 2014). It is also important to distinguish between the overnight practices of transhumance, summer pastures in mountainous regions and year-round farms, which have more permanent infrastructure such as stables or paddocks.

In most Alpine countries, night-time fencing was largely abandoned during the 20<sup>th</sup> century due to structural changes in small livestock management (Heurich et al., 2019). However, in the French Alps, “penning the sheep overnight by means of portable fencing has been in practice since the 1970s for many herders tending flocks on high mountain pastures” (Vincent, 2014). In Switzerland, the introduction of state summering contributions for pasture management and herding of sheep flocks has resulted in a revival of the practice of secure overnight penning<sup>1</sup>.

Since the return of the wolf (*Canis lupus*) to Switzerland (Vogt et al., 2020), night pens are increasingly

used in the Alps as a protection measure. This can be either a long-term, planned approach to preventing attacks by predators or a short-term emergency measure after an attack has already occurred. So far, most attacks on livestock by large carnivores in Switzerland have occurred at night or in bad weather, usually in non-protected situations (Hahn et al., 2019). Livestock can therefore be protected efficiently with night pens and/or fenced sectors allowing continued grazing overnight.

Various types of night enclosures have proven to be effective against predators in a wide variety of agricultural, climatic and topographic contexts worldwide (e.g. Lichtenfeld et al., 2014; Samelius et al., 2020). However, the requirements for best practice of night penning are high. Their successful application requires the right choice of location, materials and design as well as correct installation and maintenance. Therefore, knowledge transfer in education and consulting is particularly important.

Various publications have contributed to the transfer and further development of practical experience in the Alpine region (e.g. ASPIR, 2017). AGRIDEA, the Swiss Association for the Development of Agriculture and Rural Areas<sup>2</sup>, has been studying and monitoring the practice of night pens on summering pas-

<sup>1</sup> <https://www.blw.admin.ch/blw/de/home/instrumente/direktzahlungen/kulturlandschaftsbeitraege/soemmerungsbeitrag.html>

<sup>2</sup> <https://www.agridea.ch/en/>

tures in the Alps for over 20 years. Experience and know-how in the optimal use of night pens in Switzerland was gathered during workshops and training days. With the help of an advisory network and experienced herders, AGRIDEA recently published a booklet in three languages (German, French and Italian) that can be used for training and providing advice to herders and livestock owners (Mettler et al., 2020). In this article, we summarise the key points.

## 2. Herd protection and management

An essential prerequisite for protecting livestock from predators is appropriate grazing and flock management, without which damage prevention measures are unlikely to work. Planned management aims to keep the herd together in a flexible but compact way so that the animals can be protected, either by electric fences or, depending on the situation, with livestock guarding dogs. An electrified night pen can be used when the risk of attacks by large carnivores is high. The flock is driven into the pen every evening and, especially in Mediterranean and hotter climates, sometimes also at midday (Figs. 1–4).

The use of night pens must be adapted to the feeding cycle of ruminants. Sheep spend a total of 8–11 hours per day feeding in 4–7 grazing phases interspersed with rumination. If animals are fenced in mobile or fixed pens at midday and at night, no feed intake is possible during this time. Therefore, livestock must consume a sufficient quantity of fodder during grazing phases in order to be able to make optimal use of the remaining periods for ruminating. “Thus, a grazing circuit divides access to forage resources in an order designed to stimulate the animal’s appetite during meals in line with the schedule of use for these resources according to season and the grazing land” (Meuret, 2014).

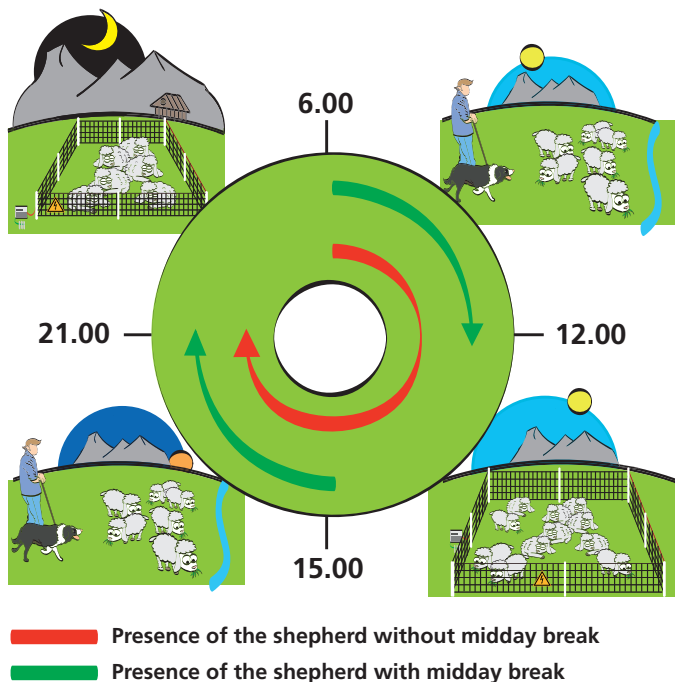
This grazing circuit is crucial for the wellbeing of all the animals and the growing rates of young lambs. If forage resources and the needs of the sheep are properly matched, growth and vitality of the animals can be ensured. This is why, especially on alpine pastures where the vegetation can be relatively poor, the experience-based knowledge of the shepherd guiding the flock is a key factor for successful flock management. Agricultural consultancy services and professional breeding associations should organise educa-



**Figs. 1–4** Herding dogs and shepherds ensure that all sheep are led into the night pen.

(Photos: AGRIDEA)





**Fig. 5** Feeding cycle of sheep with midday and night pens. (Source: AGRIDEA)

tion and training opportunities to help maintain and improve the transfer of knowledge between generations of shepherds.

The daily use of fenced overnight pens can facilitate the herder’s work rhythm. In addition, regular penning also makes the herd more compact for daily grazing management. In a system with night and midday pens (Fig. 5), the animals are let out of the pen and herded in the early morning hours. The feeding period lasts from morning to noon and from afternoon to evening. During approximately three hours at noon and during the night, the animals have sufficient time to ruminate.

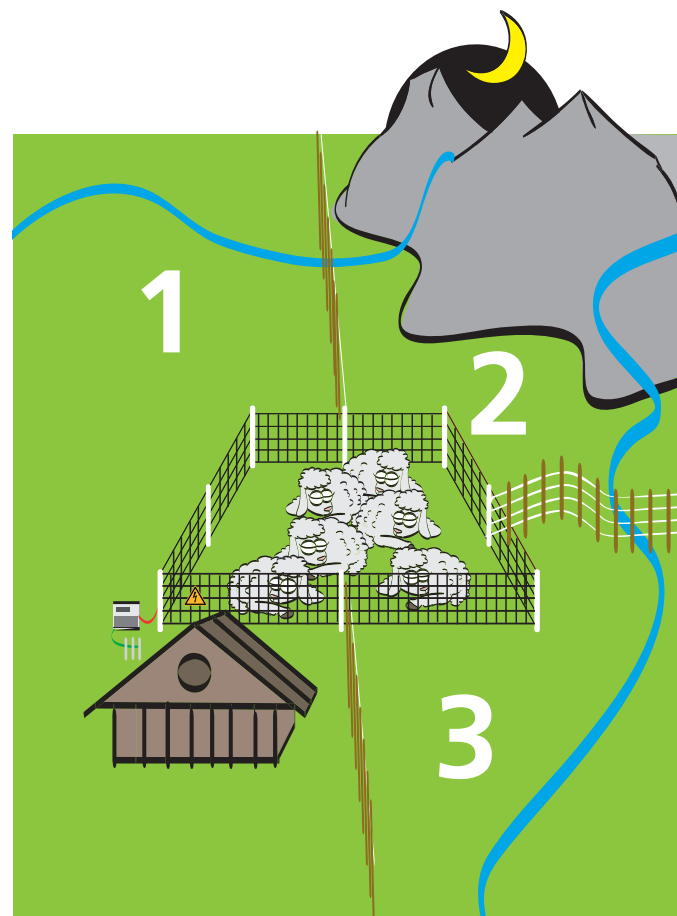
### 3. Locating pens

Night pen locations are scheduled and changed regularly throughout the summer according to the grazing area and soil conditions. Careful site selection helps to optimise animal health, pasture quality and feeding value as well as herd protection. Long distances between pens and grazing areas are best avoided. In a system with sector grazing (Fig. 6), the alp is divided into several sectors. The night pen should be located centrally but the place should be changed regularly. The location of the night pen should be well-adapted to the practice of sectoral grazing to avoid soil damage and erosion. The existing infrastructure of paths and shelters also plays an important role in organising the division of the paddock optimally (Werder and Willems, 2018).

Overnight fencing locations must be selected to best accommodate herd movement patterns and forage availability. In the case of mobile fencing, experts recommend that locations should be changed on average every 3–4 days and no later than seven days. This will help reduce the risk of transmitting diseases, parasites and infections. Wet and soft, soil-rich ground increases the risk of disease transmission and requires more frequent rotations. Likewise, extremely dry or wet weather may require more frequent rotations. The length of time before returning to the same overnight site depends on weather, pasture management options and overall animal health (Mettler et al., 2020).

### 4. Specific requirements for alpine summer pastures

The topographical and climatic conditions of alpine summer pastures provide a suitable environment for extensive grazing of sheep. However, in order to have a positive impact on the landscape and biodiversity, systematic grazing management is required. This needs to consider both sensitive areas at high altitudes as well as areas at medium altitudes situated close to



**Fig. 6:** Grazing sectors and night pens depend on topography and vegetation. (Source: AGRIDEA)



**Fig. 7** Mobile fencing with electrical wires for protection at night.

(Photo: AGRIDEA)

the shrub- and tree-line and subject to gradual encroachment (Mettler and Hilfiker, 2017). There are several challenges to achieving successful management of alpine flocks:

- Sensitive soil and vegetation conditions;
- Sheep circuits and grazing patterns;
- Adaption to changing weather conditions;
- Knowledge of topographical and morphological constraints;
- Experience-based decision-making in a dynamic environment.

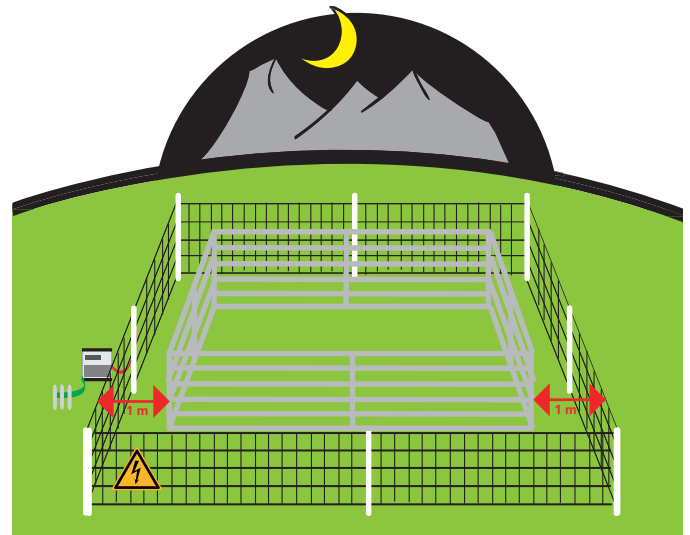
In general, sheep tend to move upwards towards young and fresh plants and to the highest zone, where soil and vegetation are vulnerable to overgrazing (Troxler and Chatelain, 2005). The shepherd has to take this fact into consideration when planning the daily circuit and grazing cycles. Good practice in the use of night pens is strongly linked with experience-based knowledge of vegetation, the behaviour of the flock and changing weather conditions. “The experienced shepherd ensures the installation of night pens before changing circuit and sector. With the constraint of a nightly penning, it is important to use different departure and arrival circuits from and to the pen to mitigate as much as possible the phenomenon of erosion” (ASPIR, 2017).

In the Alpine region, large flocks are often aggregations of different breeds from different owners brought together for the summer season. This makes herding challenging and requires a consistent presence of a shepherd with herding dogs. Only in this way can all animals be driven regularly into the night pen. When herding in difficult alpine terrain, animals move in their natural daily rhythm and are influenced by various other factors. A flock therefore moves in certain patterns that the shepherd must take into account when managing the pasture and penning (Fig. 7). “The pattern produced by a flock depends on the individual and group behaviour of sheep. Their behaviour is influenced by several factors, including the endogenous rhythms of sheep, previous activity, weather conditions, and the actions of the herder who regulates the edible vegetation ‘offer’ and controls the direction and speed of the flock” (Lécrivain et al., 2014).

Since weather conditions can change quickly in alpine zones, thunderstorms and snowy weather are an important risk factor in pasture management. Night or bad weather pastures can be used to herd and graze animals as safely as possible despite fog, snow and lightning (Figs. 8–9). Such fenced pastures provide a safe haven in extreme situations, allowing animals to feed in the morning, during the day and in



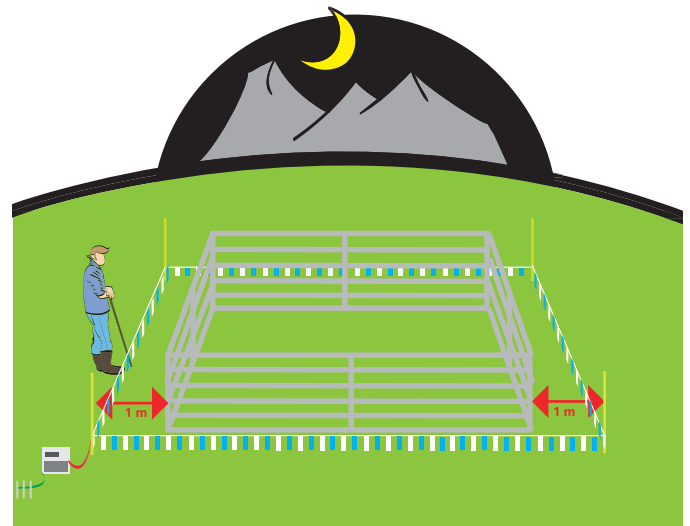
the evening for several days. The sizes of these pastures depend on the daily herding time, the number of animals, the quality of feed and the weather conditions. Compared to night pens, the advantage of fenced night pastures is that they extend the time available for feeding. Night and bad weather pastures can be securely fenced to provide protection from predators during feeding times. However, the fencing of medium to large areas requires much more material and a high additional input of labour, especially in difficult terrain. There is still a considerable number of alpine farms working without livestock guarding dogs (LGDs). In this situation night pens could be a good method to prevent damages during the night.



**Fig. 10** Metal night pen reinforced with an electrical net. (Source: AGRIDEA)



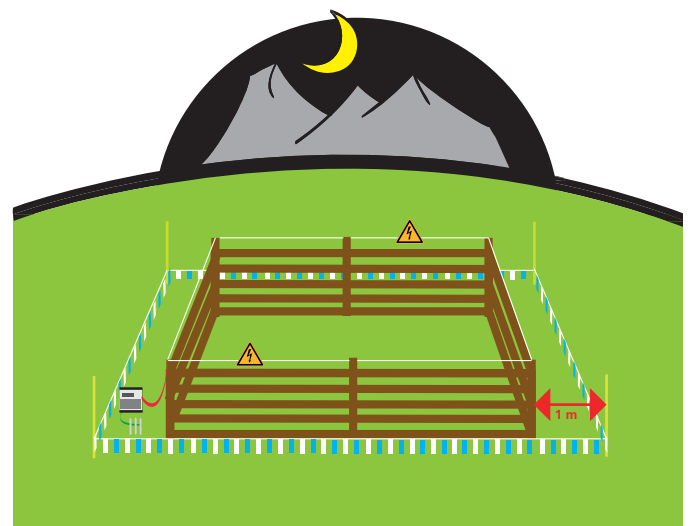
**Fig. 8** If guarding dogs are present the night pen is normally constructed with a simple electrified net. (Photo: AGRIDEA)



**Fig. 11** Metal night pen reinforced with fladry. (Source: AGRIDEA)



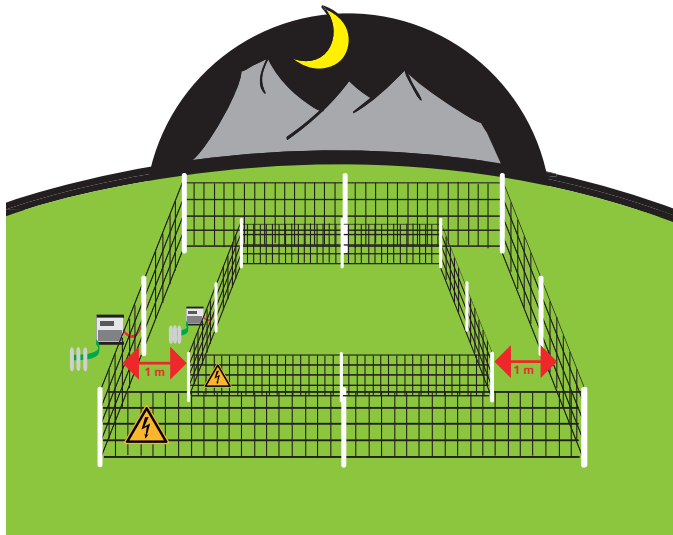
**Fig. 9** Fenced pasture for bad weather (snow or thunderstorms), mostly with 4-5 electrical wires. (Photo: AGRIDEA)



**Fig. 12** Wooden fixed night pen reinforced with fladry. (Source: AGRIDEA)

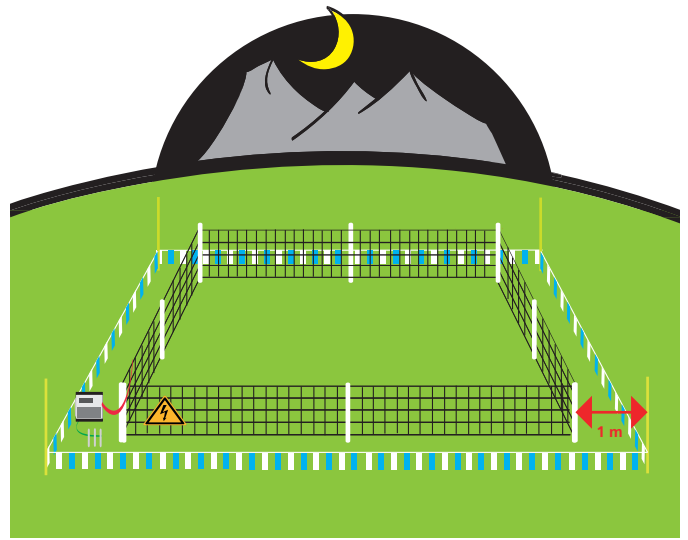
## 5. Types of night pens and choice of material

Depending on site conditions and pasture planning, either mobile or fixed night pens can be used or combined in various ways. For example, a fixed night pen near a shepherd's hut can be combined with mobile night pens to ensure regular rotation. In the Alps, 'fixed' (permanent) night pens consist of fenced paddocks made of solid materials such as wood, iron, or stone with an average height of 1.20 m. Such pens rarely provide adequate protection from large predators, which can climb over them. Therefore, to protect flocks, they should be reinforced with additional electric fencing material or LGDs (Fig. 10). Night pens can be secured with additional strand fencing, willow netting or polytape. This should be installed 1–1.5 metres outside the fixed pen (Figs. 11–12).



**Fig. 13** Doubled electric mobile fence. (Source: AGRIDEA)

The term 'mobile' night pen is used when flexible fencing material such as willow netting or strand fencing is used. An electrified mobile night pen can provide good protection even without LGDs if it is properly constructed and maintained. With mobile pens, there is a higher risk of animals escaping if they have not eaten enough or a night-time disturbance occurs. It may be helpful to establish a buffer zone to reduce the risk of escape. This can be done by installing a double electric fence (Fig. 13) with strands of willow netting and electrified flutter tape 1–1.5 metres outside the first fence (Fig. 14). Another option is a so-called stop fence. This consists of simple fence extensions at the corners of the pen which prevent large carnivores from running around the pen and causing panic through rapid movement (Fig. 15).

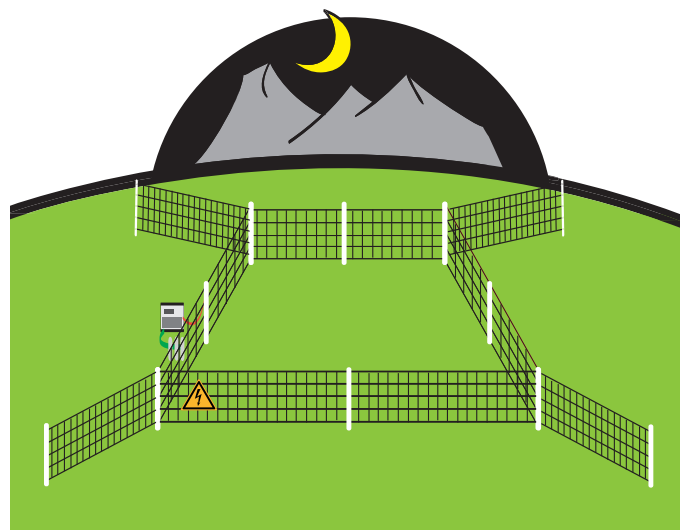


**Fig. 14** Electric fence reinforced with fladry.

(Source: AGRIDEA)

The shape of the night pen should be adapted to the terrain. Narrow passages or acute angles should be avoided, as they increase the risk of escape. The size and stocking density of the pen must be adapted to the number of animals, weather and soil conditions as well as the type of vegetation. Animals should be able to avoid each other within the fence, so that herd movements do not immediately lead to escape. Depending on these factors, allow 1–5 m<sup>2</sup> per mother animal (Probo and Perotti, 2020). Thanks to the action of the animals' hooves and the increased nutrient concentration from their dung, even targeted pastures which were abandoned for a while can be improved.

When choosing and installing fencing material, make sure that fences are highly visible. Fences with contrasting colours, such as blue-and-white or black-and-white, have proven to be particularly effective.



**Fig. 15** Electric mobile fence with corner extensions to stop predators running around the fence. (Source: AGRIDEA)

