

# Translation of Veterinary Texts: Post-Editing for Different Target Audiences Amid MT Limitations

Mehmet Cem Odacıoğlu\*

Department of Translation & Interpreting, University of Bartın, Bartın, Türkiye

Fadime Çoban

Department of Translation & Interpreting, University of Bartın, Bartın, Türkiye

**Abstract**—This research fundamentally examines how machine-generated translations of veterinary texts might be post-edited. Given the specialized terminology and knowledge required in veterinary texts, their translations must be conducted by an expert translator with a background in translations of veterinary texts or medical science. Proficiency in translation technologies is also essential for an effective post-editing process. Predictably, the primary audience for veterinary texts consists mainly of professionals in veterinary medicine, including academics and veterinarians. Nevertheless, additional target groups, including an intermediate readership, i.e. veterinary students, pet owners or even farmers without veterinary expertise (laymen), still seek information for specific circumstances. In this study, a specialized text from the *Merck Veterinary Manual* or *MCV* (Abdul-Aziz et al., 2016) was randomly selected, and the raw translation output was generated using *Google Translate*. Analysis revealed that *Google Translate*'s initial translations were done in a sophisticated language, primarily targeting professionals. Based on this finding, it can be said that despite utilizing neural MT systems, *Google Translate* may tend to overlook the potential variability of other target audiences or groups. Therefore, unlike a human translator, who likely possesses contextual knowledge in advance, *Google Translate* might fail to adapt translations for distinct audience groups. The fact that the raw outputs of the *MCV* from *Google Translate* adhere to a semantic or literary translation, primarily targeting professionals, suggests that light post-editing may suffice for this audience most of the time because they possess prior knowledge or experience in veterinary medicine. In contrast, non-experts may require full post-editing to thoroughly comprehend the text.

**Index Terms**—MT, post-editing, *Merck Veterinary Manual*, *Google Translate*

## I. INTRODUCTION

It is a well-known fact that in specific fields, translation tasks are performed by machines to achieve rapid translation outputs, and the scale of translations produced by machines has grown immensely so far. Machine translation trials, however, did not originate in the 21st century. It can be said that traces of MT can be found as far back as the era of World War II. Particularly, during the Cold War period between the United States and Russia, MT trials were already developed for Russian-English translations, meaning that more investments were made in MT as early as 1945. However, due to the primitive nature of MT systems and the excessive costs, investments in MT reached a standstill by the year 1966 when the ALPAC Report was published (also see Hutchins, 2001; Hatim & Munday, 2004; Odacıoğlu, 2017).

In the 1980s, especially with American companies seeking global expansion, localization efforts enhanced. Beginning with software localization, localization has evolved into a significant industry today, encompassing various types such as website, multimedia, video game, and mobile application localization (cf. Esselink, 2003)<sup>1</sup> or “small device localization” (see Jimenez-Crespo, 2013). Hence, there has been a notable resurgence in MT investments, previously believed to have concluded with the 1966 ALPAC Report.

Nowadays, MT technologies have led to the development of systems that go beyond rule-based MT, including statistical and neural MT. Specific MT systems even utilize a hybrid approach for more qualified translation outputs. Moreover, contemporary CAT tools are being designed to include MT systems or API keys for enhanced MT support. While early MT systems mainly focused on grammar, advancements in MT provide more contextual and human-like translations.

This study explores how machine-generated translations can be post-edited in the case of veterinary texts requiring specific terminology and expertise. Given the specialized nature of veterinary texts, they should ideally be translated by an expert translator. When opting to incorporate MT systems in the translation of these texts, translators, in addition to their expertise, should possess a solid comprehension of translation technologies for the effective execution of the post-editing process.

The primary audience for veterinary texts consists of academics and veterinarians. Nonetheless, veterinary students, pet owners or farmers are also available as potential readers of such texts. For instance, a farmer can read a veterinary

---

\* Corresponding Author.

<sup>1</sup> <https://multilingual.com/downloads/screenSupp57.pdf>

text for his/her livestock's diseases. Therefore, understanding the preferences of various readers, including professional veterinary students and laymen, is crucial in translating veterinary texts.

This study aims to explore intriguing questions based on some randomly selected excerpts of the text "Babesiosis" from *the Merck Veterinary Manual* (Abdul-Aziz et al., 2016). *Google Translate*'s raw outputs of the text in question have been assessed in the study. As known, *Google Translate* utilizes the NMT infrastructure since 2016 and demonstrates improved translation capabilities in over a hundred languages compared to previous years<sup>2</sup>.

#### A. Research Questions

The research questions can be listed as:

1. What type of post-editing can be employed in terms of professionals in the raw output of "Babesiosis" from the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016)?
2. What type of post-editing can be employed in terms of laymen in the raw output of "Babesiosis" from the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016)?
3. Is *Google Translate* capable of determining various target audiences when generating its initial translation outputs?

#### B. Research Methodology

The study was carried out based on comparing some excerpts from the 11<sup>th</sup> Edition of *Merck Veterinary Manual* text (Abdul-Aziz et al., 2016) and its raw translation done by *Google Translate* into Turkish. In doing so, the extent to which the raw translation provided by *Google Translate* might require post-editing based on different target groups was discussed. In the study, it was also aimed to show possible deficiencies of MT systems and guide future studies.

## II. LITERATURE REVIEW

In translation studies, veterinary texts have received little scholarly attention. However, Romero's 2013 study titled *Veterinary translation: An undiscovered specialty in the health sciences* represents a significant step by questioning whether translations of veterinary texts should be recognized as a distinct specialty. Romero explored whether translators could leverage their expertise in medical translation for veterinary texts and identified key factors essential for high-quality translations in this field (Romero, 2013). Similarly, in 2015, León et al. highlighted the need for collaboration among experts in linguistics, translation, and veterinary medicine to accurately translate the *Manual of diagnostic tests and vaccines for terrestrial animals (Mammals, Birds, and Bees)* into Spanish, following both scientific and linguistic precision (León et al., 2015).

Veterinary texts can be viewed as a sub-field of the health sciences, and their translation should follow similar principles to those used in medical translation. Translations of veterinary texts mostly require high scientific and linguistic accuracy, even though there are exceptions<sup>3</sup>. As known, medical translation is a well-established specialized field where identifying the target audience is crucial for ensuring the quality of the translation. Once the target audience is determined, appropriate translation strategies are applied, ranging from maintaining fidelity to the source text to making the text more accessible through simplification/generalization or omission/addition techniques. For instance, if the translation closely follows the source text, the target audience is likely medical professionals. If the translation prioritizes comprehensibility, the audience could be medical/veterinarian students, whereas simplifications/generalizations or omissions/additions might be applied for a layman.

Given the similarities between veterinary and medical texts, translations of veterinary texts can be classified as specialized translations where the target audience plays a pivotal role (cf. Newmark, 1979; Drăcșineanu, 2019). Moreover, since veterinary texts are related to medicine, they can also be considered technical texts. The rise of MT has significantly improved the efficiency of translating technical texts, including veterinary texts, providing faster and more productive outputs (cf. Bywood et al., 2017). Many companies, publishing houses, and institutions now rely on MT for technical texts, followed by post-editing to ensure accuracy and quality.

In this context, the use of MT for veterinary texts becomes possible. Developing neural MT and AI-driven systems has led to increasing success rates. Nevertheless, there are several important questions to consider: Can MT systems accurately identify the target audience in veterinary medicine as a specialized field? Are MTs of veterinary texts superior to those produced by human translators? If so, to what extent is this superiority limited? Can MT be trusted when the target audience is diverse? And how post-editing should be applied in case the target audience shifts?

These queries have led to the research questions mentioned in the introduction part. For this purpose, studies comparing MT with human translation were also reviewed. A study published in 2024 scrutinized human translation and MT, focusing on Arabic-English legal texts. The findings disclosed that while MT can generate productive/faster translations, human translation generally achieves higher levels of success. This is because a human translator is more likely to understand the legal background and preserve the legal impact in the translation. Nonetheless, as technology advances and the amount of data input into AI systems increases, translations performed by artificial intelligence may improve in the future (Moneus & Sahari, 2024).

<sup>2</sup> (See <https://blog.research.google/2020/06/recent-advances-in-google-translate.html>).

<sup>3</sup> If the target audience is composed of laymen, scientific discourse can be simplified to increase the intelligibility of the text as an exception.

In 2013, Schulz et al. compared machine and human translations of SNOMED CT medical terminology from English to German. It was found in the study that the inter-rater reliability, measured by Kappa, was 0.4 in terms of linguistic correctness and 0.23 in terms of content fidelity. The average ratings for linguistic correctness marked no significant difference between the various human translation scenarios. Nevertheless, content fidelity was rated a bit higher in terms of student translators than professional translators. Upon comparing MT to human translation, linguistic correctness favored human translation by approximately 0.5 scale units, and content fidelity also favored human translation by about 0.25 scale units. Especially, a human translator doing post-editing can produce qualified translations (Schulz et al., 2013)<sup>4</sup>.

In 2021, Sokolova published a study titled *Machine vs human translation in the synergetic translation space*, where she compared machine and human translation in English-Russian language pairs. Sokolova concluded that human translation is more acceptable than MT, particularly in the context of patent translations (Sokolova, 2021).

Comparisons between MT and human translation are sometimes conducted beyond technical texts as well. In 2023, Noriega-Santi  n  ez & Corpas Pastor examined the outputs of machine and human translation of literary works using *Google Translate*, *DeepL*, and *Phrase TMS*. They found that MT still struggles to resolve the complexities presented by formal neologism in literary texts and falls short in the creative role of term creation. However, these tools can still be useful as a resource or reference, especially for students<sup>5</sup> (Noriega-Santi  n  ez & Corpas Pastor, 2023).

### III. ANALYSIS

#### A. Brief Information on the 11<sup>th</sup> Edition of *Merck Veterinary Manual*

The 11<sup>th</sup> Edition of *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) (*MVM*) has addressed the diverse facets of veterinary medicine<sup>6</sup>. This edition continues to provide authoritative insights into the diseases and management of food-producing, companion, laboratory, and exotic animals. The edition also systematically includes all body systems, offering detailed discussions on disease etiology, diagnosis, treatment, control, and prevention. The latter half of the book delves into special topics such as behavior, clinical pathology, management and nutrition, pharmacology, toxicology, and poultry medicine. *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) is also available both online and as a handheld device app. It also offers enhanced accessibility to its contents. Digital versions are regularly updated through thousands of supplementary images and multimedia resources (*Merck Veterinary Manual* Foreword, Abdul-Aziz et al., 2016).

#### B. Babesiosis Text (ST), Its Raw Outputs by Google Translate (GT), Assessments of Google Translate Raw Outputs and Post-editing Processes

This section offers the original text (ST) of "Babesiosis" from *Merck Veterinary Manual* (Abdul-Aziz et al., 2016), the raw translation output (GT) by *Google Translate*, including the intended/determined target of the initial translations by MT engine, and post-editing processes for different target groups, whether in a light or full manner based on the scientific approaches.

*ST*: "Babesiosis is caused by intraerythrocytic protozoan parasites of the genus *Babesia*. Transmitted by ticks, babesiosis affects a wide range of domestic and wild animals and occasionally people. Although the major economic impact of babesiosis is on the cattle industry, infections in other domestic animals, including horses, sheep, goats, pigs, and dogs, assume varying degrees of importance throughout the world" (*Merck Veterinary Manual*, Abdul-Aziz et al., 2016, p. 21).

*GT*: "Babesiosis, *Babesia* cinsinin intraeritrositik protozoan parazitlerinden kaynaklanır. Keneler yoluyla bulaşan babesiosis, çok çeşitli evcil ve vahşi hayvanları ve bazen de insanları etkiler. Babesiosis'in en büyük ekonomik etkisi sığır endüstrisi üzerinde olmasına rağmen, atlar, koyunlar, keçiler, domuzlar ve köpekler de dahil olmak üzere diğer evcil hayvanlardaki enfeksiyonlar dünya çapında değişen derecelerde önem kazanmaktadır".

The source text has an encyclopedic style related to veterinary medicine, composed in a sophisticated language. *Google Translate*'s direct output also maintains a sophisticated tone with a commitment to faithful translation. Notably, source terms like "Babesia," "intraerythrocytic protozoan parasites," and "genus" are translated by *Google Translate* without rewording or paraphrasing, indicating that the intended audience primarily consists of experts/professionals in the field. The informative structure of the source text is also preserved in the translated text.

In the raw output, *Google Translate* does not consider an alternative audience beyond professionals and does not offer additional translations for different reader groups. The resulting translation aligns closely with the writing style of the source text. According to the Skopos Theory by Vermeer, translation is, however, a purposeful action, and the text type might change in translation based on the intended purpose (cf. Reiss & Vermeer, 1984, 2013). For instance, an informative

<sup>4</sup> Based on these findings, it might be put forward that veterinary texts, possibly categorized as technical texts, can also be rendered more successfully by human translators through well-determined post-editing. In these types of texts where the concept of target audience comes to the fore, performing post-editing especially in accordance with specific target groups is a crucial step for successful translation.

<sup>5</sup> There are many studies in different language pairs. As long as translators have the necessary linguistic, cultural, and technological skills (post-editing skills, effective computer use, etc.), MT systems cannot yet be said to be completely superior to human translation. Especially in fields where the concept of target audience comes to the fore, the use of MT systems may lead to inaccurate identification of the target audience and considering that the target audience is laymen other than professionals, it may be necessary to carry out a comprehensive/full post-editing process for a better translation quality.

<sup>6</sup> According to Britannica, veterinary medicine is a "medical specialty concerned with the prevention, control, diagnosis, and treatment of diseases affecting the health of domestic and wild animals and with the prevention of transmission of animal diseases to people. Veterinarians ensure a safe food supply for people by monitoring and maintaining the health of food-producing animals" (<https://www.britannica.com/science/veterinary-medicine>).

text can be conveyed to a different audience with a more expressive tone. Alternatively, when translating for laymen, situations may arise where the source text needs to be simplified. For instance, the jargon of the original text might need to be explained or even omitted without distorting the meaning (see Munday et al., 2022). *Google Translate* seems to neglect these considerations. In addition, *Google Translate* has transformed the encyclopedic structure from the source to the target text following an adequate translation and adhering to professional use/discourse (Toury, 1995).

*Light Post-Edited Version of ST towards Professionals*: “Babesiosis, Babesia cinsine ait türlerin neden olduğu, intraeritrositik protozoan parazitlerinden kaynaklanır. Keneler aracılığı ile bulaşan söz konusu bu rahatsızlık, çeşitli evcil ve vahşi hayvanları ve bazen de insanları tutmaktadır. Babesiosis, sığır endüstrisi üzerinde büyük ekonomik etkileri beraberinde getirir. Atlar, koyunlar, keçiler, domuzlar ve köpekler başta olmak üzere diğer evcil hayvanlarda görülen enfeksiyonlar dünya genelinde değişen oranlarda önem arz etmektedir”.

In this light post-edited version, only word-level changes have been applied.

- “Babesios”: “Söz konusu bu rahatsızlık”
- “Çok çeşitli”: “Çeşitli”
- “Etkiler”: “Tutmaktadır”
- “En büyük ekonomik etkisi”: “Büyük ekonomik etkileri beraberinde getirir”
- “Dahil olmak üzere”: “Başta olmak üzere”
- “Ki enfeksiyonlar”: “Görülen enfeksiyonlar”
- “Dünya çapında”: “Dünya genelinde”
- “Değişen derecelerde”: “Değişen oranlarda”

*Full Post-Edited Version of ST towards Laymen*: “Babesyozya veya halk dilinde kırçan hastalığı<sup>7</sup>, keneler yoluyla bulaşan, evcil ve vahşi hayvanları (örneğin at, koyun, keçi, domuz ve köpekler) etkileyen bir rahatsızlıktır. Söz konusu bu rahatsızlık sığır endüstrisi üzerinde büyük bir ekonomik etkiye sahiptir. Bununla birlikte vahşi ve evcil hayvanlarda babesyozya kaynaklı birtakım enfeksiyonlar görülebilmektedir. Bu enfeksiyonların, dünya genelinde değişen derecelerde önemi vardır”.

As indicated in this post-edited sentence, medical jargon has been simplified, and some medical terms have been omitted from the text. The content has been post-edited with a fluent tone. This serves as an illustration of comprehensive/full post-editing. In the post-edited version, the visibility principle of the translation has been converted into invisibility (Venuti, 1994). Full post-editing is generally preferred by laymen for clarity or intelligibility. Considering the target audience as ordinary people, this can be perceived an acceptable translation (Toury, 1995), which means that despite the post-edited text losing its encyclopedic tone, this version still includes other target audiences or target groups except *Google Translate* output and the light-post edited version towards professionals.

*ST*: “Two important species in cattle- *B bigemina* and *B bovis*-are widespread in tropical and subtropical areas and are the focus of this discussion. However, because there are many common features of the diseases caused by *different Babesia*, much of this information can be applied to other species” (*Merck Veterinary Manual*, Abdul-Aziz et al., 2016, p. 21).

*GT*: “Sığırlarda iki önemli tür olan *B bigemina* ve *B bovis*, tropik ve subtropikal bölgelerde yaygındır ve bu tartışmanın odak noktasını oluşturmaktadır. Ancak farklı *Babesia*'ların neden olduğu hastalıkların pek çok ortak özelliği olduğundan, bu bilgilerin çoğu diğer türlere de uygulanabilir”.

Similar to the example above, the raw translation output was generated by *Google Translate*, considering professionals in the field of veterinary medicine. Then, it can be asserted that the raw translation has not been done in terms of variability of target groups, and a single target audience has been identified, instead.

*Light Post-Edited Version of ST towards Professionals*: “*B bigemina* ve *B bovis*, sığırlarda iki önemli türü teşkil etmekte ve tropik/subtropikal bölgelerde sıkça görülmektedir. Tartışmanın odak noktası budur. Fakat farklı *Babesia*'ların sebep olduğu hastalıkların ortak özelliği çoktur. Bu bilgilerin çoğu diğer türler için de geçerlidir”.

Word-level changes and changes of place in sentences have been applied in the light post-edited version of MT output.

- “Sığırlarda iki önemli tür olan *B bigemina* ve *B bovis*”: “*B bigemina* ve *B bovis*, sığırlarda iki önemli türü teşkil etmekte”
- “Tropik ve subtropikal bölgelerde yaygındır”: “Tropikal/subtropikal bölgelerde sıkça görülmektedir”
- “Bu tartışmanın odak noktasını oluşturmaktadır”: “Tartışmanın odak noktası budur”.
- “Ancak”: “Fakat”
- “Neden olduğu”: “Sebep olduğu”
- “Pek çok ortak özelliği olduğundan:” Ortak özellikleri çoktur”
- “Bu bilgilerin çoğu diğer türlere de uygulanabilir”: “Bu bilgilerin çoğu diğer türler için de geçerlidir”.

During this light post-editing of MT output, some repetitions<sup>8</sup> of *Google Translate* have also been revised and changed.

*Full Post-Edited Version of ST towards Laymen*: “Babesyozya veya kırçan hastalığı sığırlarda da ortaya çıkabilir”.

<sup>7</sup> Babesiosis was transferred using transliteration towards laymen. In common Turkish, it is also known as “kırçan”, “ağrıma”, “ağrık”, “kan işeme” (<https://vetrehberi.com/koyunlarda-babesiosis-agrimasi-piroplasmosis/>).

<sup>8</sup> “Neden olduğu hastalıkların pek çok ortak özelliği olduğundan”. In this raw output, “olduğu” was used twice by *Google Translate*. It was therefore post-edited as “Fakat farklı *Babesia*'ların sebep olduğu hastalıkların ortak özelliği çoktur”.

A curious farmer searching for the disease in his/her cattle or trying to understand why his/her cattle are sick does not apply to the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) as the first source most of the time. He/she can rely on basic online searches, which is enough for him/her. If this translation is published online, as a brochure or a book based on special needs by shifting its encyclopedic tone, terms such as 'B bigemina' and 'B bovis' in the ST are not essential for the farmer, and as such, they might be excluded from the text during thorough/full post-editing. There is also no need to translate "Widespread in tropical and subtropical areas" into Turkish because Turkey is not located in tropical region. All of these align with Skopos Theory of translation (Reiss & Vermeer, 1984, 2013)<sup>9</sup>.

*ST*: "The main vectors of *B bigemina* and *B bovis* are *I-hostRhipicephalus (Boophilus)* spp ticks, in which transmission occurs transovarially. Although the parasites can be readily transmitted experimentally by blood inoculation, mechanical transmission by insects or during surgical procedures has no practical significance. Intrauterine infection has also been reported but is rare" (*Merck Veterinary Manual*, Abdul-Aziz et al., 2016, p. 21).

*GT*: "B bigemina ve B bovis'in ana vektörleri, transovarial olarak bulaşmanın gerçekleştiği I-hostRhipicephalus (Boophilus) spp keneleridir. Her ne kadar parazitler deneysel olarak kan aşılama yoluyla kolayca aktarılabilir de, böcekler yoluyla veya cerrahi prosedürler sırasında mekanik olarak bulaşmanın pratikte bir önemi yoktur. Rahim içi enfeksiyon da rapor edilmiştir ancak nadirdir".

It can be noted that the raw translation generated by *Google Translate* is formulated in a more elevated style and is specifically intended for an audience characterized as professionals, given its incorporation of specialized terminology.

*Light Post-Edited Version of ST towards Professionals*: "B bigemina ve B bovis'in ana vektörleri, transovarial olarak bulaşmanın cereyan ettiği I-hostRhipicephalus (Boophilus) spp keneleridir. Parazitler deneysel olarak kan yoluyla kolaylıkla aktarılabilmesine rağmen, böcekler aracılığıyla veya cerrahi işlem esnasında mekanik yollarla bulaşmanın pratikte bir önemi bulunmamaktadır. Rahim içi enfeksiyon da bildirilmiştir ancak seyrek".

Upon closer examination with minor adjustments, word-level modifications in *Google Translate's* raw translation prove satisfactory for professionals. Besides, removing content from the text, unlike with laymen, can result in a negative attitude in terms of professionals.

- "Gerçekleştiği": "cereyan ettiği"
- "Her ne kadar": "E- rağmen"
- "Kan aşılama": "Kan yoluyla"
- "Böcekler yoluyla": "Böcekler aracılığıyla"
- "Cerrahi prosedür": "Cerrahi işlem"
- "Mekanik olarak": "Mekanik yollarla"
- "Yoktur": "Bulunmamaktadır"
- "Rapor edilmiştir": "Bildirilmiştir"
- "Nadirdir": "Seyrek"

In the full post-editing of the source text, these sentences were entirely removed for the general audience. Because these pieces of information constitute an unnecessary knowledge for ordinary individuals.

*ST*: "Other circumstances that can lead to clinical outbreaks include the introduction of susceptible cattle to endemic areas and the incursion of *Babesia-infected* ticks into previously tick-free areas. Strain variation in immunity has been demonstrated but is probably not of practical significance in the field" (*Merck Veterinary Manual*, Abdul-Aziz et al., 2016, p. 21).

*GT*: "Klinik salgınlara yol açabilecek diğer koşullar arasında duyarlı sığırların endemik bölgelere girişi ve Babesia ile enfekte kenelerin daha önce kene bulunmayan alanlara yayılması yer alır. Bağışıklıktaki tür değişimi gösterilmiştir ancak bu alanda muhtemelen pratik bir öneme sahip değildir".

*Google Translate's* initial translation is based on a semantic/literal translation approach, adhering to the principle of visibility (Venuti, 1994). Considering this information, one could contend that the intended audience identified by *Google Translate* is professionals.

*Light Post-Edited Version of ST towards Professionals*: "Salgınlara sebep olabilecek diğer koşullar içinde duyarlı<sup>10</sup> sığırların endemik bölgelere girmesi ve Babesia ile enfekte olan kenelerin daha önce kene görülme-yen alanlara yayılması bulunmaktadır. Bağışıklıktaki tür değişimi bildirilmiştir. Bununla birlikte pratik bir önemi yoktur".

Minimal changes have been performed during the light post editing of ST.

- "Clinical outbreaks": "Salgınlar"<sup>11</sup>
- "Yol açabilecek": "Sebeb olabilecek"
- "Arasında": "İçinde"
- "Girişi": "Girmesi"
- "Enfekte": "Enfekte olan"

<sup>9</sup> What the farmer is eager to know is whether this newly encountered disease might manifest in his/her cattle, aside from ticks. Hence, a translation indicating the potential occurrence in cattle can be deemed acceptable (see Toury, 1995) by him/her. Refinement or simplification through additions or omissions in the translation can be seen as a form of comprehensive/full post-editing.

<sup>10</sup> "Duyarlı" means here "hastalığa karşı duyarlı". A professional can grasp the meaning of "duyarlı," but offering an explanation enhances the clarity of the translation for the general audience.

<sup>11</sup> The term "clinical" was omitted from the light post edited version of ST. The omission is small scale.

- “Bulunmayan”: “Görülme”
- “Yer alır”: “Bulunmaktadır”
- “Gösterilmiştir”: “Bildirilmiştir”
- “Ancak:” “Bununla birlikte”
- “Sahip değildir”: “Yoktur”

*Full Post-Edited Version of ST towards Laymen:* “Salgınlara yol açan diğer koşullardan bazıları arasında hastalığa karşı duyarlı sığırların söz konusu hastalığın ortaya çıktığı bölgeye girmesi ve Babezya ya da halk dilinde kırçan hastalığı bulaşan kenelerin daha önce kene görülmeyen alanlara yayılması bulunmaktadır.”

The word "klinik" has been omitted from the post-edited version. The Turkish phrase "duyarlı sığırlar" generated by MT has been reworded for ordinary people as "hastalığa karşı duyarlı”.

The term "endemic," known to many people today, has also been paraphrased as "söz konusu hastalığın ortaya çıktığı bölge" for the benefit of the general reader. "Babesia" has been transliterated as "babezya" and further explained as "kırçan hastalığı" a term frequently heard by farmers. This simplification is aimed at enhancing the accessibility and easy readability of the text. The final source sentence which is included in the translation output by *Google Translate* is deemed less relevant for the general readership and hence has been excluded in this post-edited version. Intervening in the text in this way by altering the target audience, making additions or deletions, simplifying and generalizing the text indicates the full post-editing process.

*ST:* “B bovis is a much more virulent organism than B bigemina. With most strains of B bigemina, the pathogenic effects relate more directly to erythrocyte destruction. With virulent strains of B bovis, a hypotensive shock syndrome, combined with generalized nonspecific inflammation, coagulation disturbances, and erythrocytic stasis in capillaries, contribute to the pathogenesis” (*Merck Veterinary Manual*, Abdul-Aziz et al., 2016, p. 21).

*GT:* "B bovis, B bigemina'dan çok daha öldürücü bir organizmadır. Çoğu B bigemina suşunda patojenik etkiler daha doğrudan eritrosit tahribatıyla ilişkilidir. B bovis'in virulan suşlarında hipotansif şok sendromu, genelleştirilmiş spesifik olmayan inflamasyon, pıhtılaşma bozuklukları ve kılcal damarlarda eritrositik staz ile birlikte patogeneze katkıda bulunur”.

This MT output can be said to intend professionals in terms of the concepts and expressions, reflecting the intended audience of the target text but overlooking the possible presence of other target groups.

*Light Post-Edited Version of ST towards Professionals:* "B bovis, B bigemina'ya kıyasla daha virulan yapıya sahip bir organizmadır. B bigemina'nın çoğu suşunda patojenik etkiler daha doğrudan eritrosit tahribatıyla ilişkilendirilebilmektedir. B Bovis virulan suşları ile birlikte, hipotansif şok sendromu, genelleştirilmiş spesifik olmayan inflamasyon, pıhtılaşma bozuklukları ve kılcal damarlarda eritrosit stazının bir araya gelmesi, patogeneze katkı yapmaktadır”.

Professionals can comprehend the intended meaning of this text without the need for light post-editing simply by reading the raw output for information gathering. Still, light post-editing has been applied to revise the text.

- “Virulent”: “Virulan yapı”
- “Çoğu B bigemina suşunda”: “B bigeminanın çoğu suşunda”
- “İlişkilidir”: “İlişkilendirilebilmektedir”
- “B bovis'in virulan suşlarında”: “B Bovis virulan suşları ile birlikte”
- “İle birlikte”: “Bir araya gelmesi”
- “Katkıda bulunur”: “Katkı yapmaktadır”

The content within ST consists of technical details that may not be relevant or important for the general audience or laymen. Therefore, these sentences have entirely been excluded in the full post-editing of the source text.

*ST:* “Clinically, babesiosis can be confused with other conditions that cause fever, anemia, hemolysis, jaundice, or red urine. Therefore, confirmation of diagnosis by microscopic examination of Giemsa-stained blood or organ smears is essential. From the live animal, thick and thin blood smears should be prepared, preferably from capillaries in the ear or tail tip” (*Merck Veterinary Manual*, Abdul-Aziz et al., 2016, p. 21).

*GT:* “Klinik olarak babesiosis ateş, anemi, hemoliz, sarılık veya kırmızı idrara neden olan diğer durumlarla karıştırılabilir. Bu nedenle tanının Giemsa boyalı kan veya organ yaymalarının mikroskopik incelemesi ile doğrulanması önemlidir. Canlı hayvandan tercihen kulak veya kuyruk ucundaki kılcal damarlardan kalın ve ince kan yaymaları hazırlanmalıdır”.

While the MT output may seem to compromise the principle of clarity by providing literal renditions of certain words extremely, it is essential to note that the MT translation here is oriented toward professionals. This implies that the expertise of a professional reader could compensate for any knowledge errors in the translation. Nevertheless, if the translation were intended for a general audience, it would evidently require substantial refinement.

*Light Post-Edited Version of ST towards Professionals:* “Klinik açıdan babesiosis ateş, anemi, hemoliz, sarılık ya da kırmızı idrara yol açan diğer durumlarla karıştırılabilmektedir. Bu yüzden tanının Giemsa ile boyanan kan veya organ yaymalarının<sup>12</sup> mikroskopik ortamda doğrulanması önemlidir. Canlı hayvandan, tercihen kulak veya kuyruk ucundaki kılcal damarlardan kalın ve ince kan yaymaları hazırlanmalıdır”.

<sup>12</sup> For the term “smear”, “yayma” is also encountered in the relevant literature.

Word-level changes have been applied for the light post-edited version towards professionals.

- “Klinik olarak: “Klinik açından”
- “Veya”:"Ya da”
- “Neden olan”: “Yol açan”
- “Karıştırılabilir: “Karıştırılabilmektedir”
- “Bu nedenle”: “Bu yüzden”
- “Boyalı”: “Boyanan”
- “İncelemesi”: “Ortamda”

*Full Post-Edited Version of ST towards Laymen:* “Babezyoz ya da kırçan hastalığı ateş, anemi, hemoliz, sarılık ya da kırmızı idrara yol açan diğer durumlarla karıştırılabilmektedir”.

Only the initial sentence has been post-edited. The remaining sentences contain technical intricacies and are designed for a professional audience. Therefore, they have been entirely removed from the full post-edited version of MT output. Making sentence-level omissions that go beyond word-level omissions in translation might also be regarded as part of the full post-editing process. For a general readership, rendering solely the first sentence would imply an acceptable translation (Touy, 1995).

*ST:* “A variety of drugs have been used to treat babesiosis in the past, but only dinlinazene acetate and imidocarb dipropionate are still in common use. These drugs are not available in all endemic countries, or their use may be restricted. Manufacturers' recommendations for use should be followed” (*Merck Veterinary Manual*, 2016, Abdul-Aziz et al., p. 21).

*GT:* “Geçmişte babesiosis tedavisinde çeşitli ilaçlar kullanılmış ancak yalnızca dinlinazen asetat ve imidokarb dipropiyonat hala yaygın olarak kullanılmaktadır. Bu ilaçlar tüm endemik ülkelerde mevcut değildir veya kullanımları kısıtlanabilir. Üreticilerin kullanım önerilerine uyulmalıdır”.

The source text encompasses information regarding medications used in the treatment of babesiosis. Efforts have been made to maintain this content in the raw translation output. Terminologies such as “acetate and imidocarb dipropionate” require specific knowledge. The source text is the *Merck Veterinary Manual (MVM)* (Abdul-Aziz et al., 2016), a book tailored for professionals. The raw translation done by *Google Translate* faithfully reflects the language of the source text without adding interpretation or employing sense for sense translation. Essentially, this has resulted in a translated text, overlooking the possibility of variations for the target audience.

Indeed, in all translations assessed so far, this overlooking by *Google Translate* has consistently been observed. Nevertheless, as indicated in Skopos Theory (Reiss & Vermer, 1984, 2013), the target audience can differ, and the informative nature of the source text may, for instance, transform into an expressive style (see Munday et al., 2022). If the target audience changes based on the intended purpose, the final translation of the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) encyclopedia might be transformed into a brochure, a website or a non-specialized book post accessible to anyone and providing information about the veterinary discipline.

*Light Post-Edited Version of ST towards Professionals:* “Geçmişte babesiosis tedavisinde çeşitli ilaçlar kullanılsa da sadece dinlinazen asetat ve imidokarb dipropiyonat hala yaygın şekilde kullanılmaktadır. Bu ilaçlar her endemik ülkede bulunmamaktadır<sup>13</sup> ya da kullanımları kısıtlıdır. Üreticilerin kullanım önerilerine uyulması tavsiye edilmektedir”.

Minor word-level adjustments are sufficient for professionals during light post-editing of MT output.

- “Kullanılmış”: “Kullanılsa da”
- “Yalnızca”: “Sadece”
- “Yaygın olarak”: “Yaygın şekilde”
- “Tüm endemik ülkelerde”: “Her endemik ülkede”
- “Mevcut değildir”: “Bulunmamaktadır”
- “Veya”: “Ya da”
- “Kısıtlanabilir”: “Kısıtlıdır”
- “Uyulmalıdır”: “Uyulması tavsiye edilmektedir”

*Full Post-Edited Version of ST towards Laymen:* “Geçmişte babezyoz yani kırsaçan hastalığı tedavisinde çeşitli ilaçlar kullanılsa da sadece dinlinazen asetat ve imidokarb dipropiyonat hala yaygın şekilde kullanılmaktadır”.

As said earlier, a farmer may wonder and investigate what is necessary for the recovery of his/her cattle. For curious layman, this sentence can be shortened to translate only the part providing information about the medication used to treat babesiosis. The deletions and additions, such as “kırsaçan hastalığı” in this text, may be considered a part of a full post-editing process<sup>14</sup>.

<sup>13</sup> “Her endemik ülkede” has been used instead “tüm endemik ülkelerde” for a clear translation.

<sup>14</sup> When *Google Translate's* all raw translations are analyzed, it is noticeable that target audience of the raw translations is professionals. In the case of professionals, full post-editing of the text is not preferred most of the time. Because what is needed here is to disseminate knowledge and even sell the text to its audience as soon as possible for marketing reasons. Besides, professionals can understand the translated text even if it is incomplete or includes errors or they might simply resort to the text to follow the relevant literature. In these cases, light post-editing is sufficient for this type of audience. However, when the audience of the text changes from professionals to laymen, light-post editing is not sufficient generally. By considering marketing potentials, the publisher can, however, publish or re-publish the book in a way that is understandable by laymen. In this case, full post-editing can increase sale rates and readability or clarity of the text. Sometimes, the text needs to be simplified or written in a different style for other reasons. This also means the need for full post-editing. In addition to laymen, veterinary students can, for instance, exist as a target group. As an intermediate readership, veterinary students may not have acquired expertise yet, but light post-editing can be adequate for this group as well. Unlike general readers

#### IV. DISCUSSION

When examining the text on “Babesiosis” from *The Merck Veterinary Manual* (Abdul-Aziz et al., 2016) and its translations produced by *Google Translate*, it is evident that MT systems often focus on fidelity to the source text, producing translations that maintain the original meaning with a formal tone. Nonetheless, this often results in translations that may not be suitable for all target audiences, mainly because these systems lack the ability to adapt tone, register, or simplify content based on the audience's needs. The mechanical nature of MTs is a significant limitation. Unlike human translators, MT systems do not have the capacity for nuanced understanding or creativity. This mechanical quality can be particularly problematic in specialized fields like veterinary medicine, where subtle differences in terminology or phrasing can impact the clarity or accuracy of the translation. In connection with these inferences, *Google Translate* generates translations targeting professionals, thus failing to distinguish between different target audiences, producing a translation tailored to a single audience.

The purpose of a translation is indeed shaped by the target audience as stated by Reiss and Vermeer (1984, 2013) and when this is not considered, the translation may fail to meet its intended function. The principle of relativity (Tosun, 2002) is also important in Skopos Theory. When the principle of relativity is considered in translation, it means that the target audience of the translation may change. However, this is a critical limitation of the current MT systems. They lack the ability to tailor translations to specific audiences without human intervention. This is why post-editing by a human translator is often necessary, particularly to adjust the translation for non-expert audiences who might require simplified language or additional explanations, which brings to mind the full post-editing.

In technical fields like veterinary medicine, where accuracy is pivotal, depending solely on MT outputs might be risky, especially for laymen who might misinterpret complex terms or dense information. Light post-editing might suffice for professionals, but comprehensive/full post-editing seems important for non-experts to ensure clarity and accessibility.

Gist translation, which involves quick text reading, might also be required in some cases. Regarding gist translation, the target audience is usually professionals needing quick and gist-level translations, where light post-editing might be sufficient. Ordinary people might occasionally resort to this type of translation, but in highly technical fields like veterinary medicine, gist translation could mislead ordinary people. Therefore, for non-professional audiences, full post-editing is crucial for maintaining the principle of fluency. When fluency is prioritized, the principle of literal translation is set aside, and the translator becomes invisible (Venuti, 1994). Although the invisibility principle is typically applied in translating literary works such as fairy tales, it can be exceptionally applied to specialized texts for laymen to ensure the successful transmission of information. Besides, in technical texts, where the goal is often to communicate information clearly and effectively, making the translator “invisible” (i.e., ensuring the translation is smooth and natural) can indeed be beneficial towards different target groups, except for professionals for whom light post-editing is enough. This approach intended for laymen can help prevent the translation from feeling stilted or overly literal, which might otherwise hinder understanding.

While MT offers speed and efficiency, it often falls short in areas that require a thorough understanding of the subject matter or the ability to adapt to various audiences. Human translators, with their ability to apply context, creativity, and nuance, are still essential, especially when the target audience and purpose of the translation are approached as crucial factors. Because human involvement remains crucial for ensuring the translation is accurate, appropriate, and accessible to the intended audience.

#### V. CONCLUSION

Veterinary medicine is a specialized field with a distinct audience, primarily comprising professionals such as academics and veterinarians. Texts intended for this readership typically employ scientific and sophisticated language. The *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) is carefully crafted with these principles in mind. Similarly, translations meant for those involved in both the scientific and practical aspects of veterinary science often use elevated language, utilizing semantic, literal, and word-for-word translation techniques.

Random excerpts from the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) related to “Babesiosis” text were translated using *Google Translate*. As discussed earlier, these initial translations were primarily aimed at professionals. However, it is important to consider that functional translation theories, such as Skopos Theory by Vermeer (Reiss & Vermeer, 1984, 2013), view translation as a purposeful activity, where the aim is determined by the target audience. According to this theory, the target audience might prefer the text to be more accessible or simplified or vice versa. In terms of laymen, information from the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) could be adapted beyond professionals. Though “Babesiosis” is a highly technical topic, a farmer looking for treatment options for his/her cattle may want to understand this information. Thus, the purpose of translating the *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) could shift to address to a broader audience, as suggested by Skopos Theory.

Skopos Theory emphasizes relativity (Tosun, 2002) in translation, noting that the purpose of a translation may change. At this point, it becomes clear that *Google Translate*'s ability to determine the target reader is limited, as it fails to identify

---

who seek instant information, veterinary students read veterinary texts for various reasons, including succeeding in their courses, learning about topics in their field through scientific research, and staying updated with the literature in the scientific domain. Simplification or paraphrasing can also be employed for them but most of the time, light post editing of MT outputs seems enough.



new or different target audiences. This limitation underscores the necessity of human intervention and the superiority of human translators over machines. When required, machine translation outputs can be post-edited, with the target audience accurately identified, whether through light or full post-editing. Based on the examples, human involvement is mostly felt in post-edited versions of translations.

For professionals in the veterinary field, the light post-editing of the text “babesiosis” from *Merck Veterinary Manual* (Abdul-Aziz et al., 2016) raw translation seemed sufficient, as such readers/users likely do not expect extensive simplification or generalization, and full post-editing could even be viewed negatively by them. Nonetheless, for laymen, full post-editing, which involves significant additions and deletions (Toury, 1995) seemed crucial. This also ensures that the translation intended for such readers/users is fluent (Venuti, 1994) and comprehensible, thereby improving the readability of the text for non-experts.

#### REFERENCES

- [1] Abdul-Aziz, T. et al. (2016). *The Merck veterinary manual* (Eleventh Edition) (ed. Susan E. Aiello et al.). Merck & Co., Inc., Kenilworth, NJ. <https://blog.research.google/2020/06/recent-advances-in-google-translate.html> Accession Date: 30.12.2023. <https://www.britannica.com/science/veterinary-medicine> Accession Date: 05.01.2024.
- [2] Bywood, L., Georgakopoulou, P. & Etchegoyhen, T. (2017). Embracing the threat: MT as a solution for subtitling. *Perspectives*, 25(3), 492–50.
- [3] Drăcșineanu, C. (2019). Challenges in medical translation. *Romanian journal of medical and dental education*, 8(12), 24-29.
- [4] Esselink, B. (2003). The Evolution of localization. *The Guide from multilingual computing & technology: Localization*, <https://multilingual.com/downloads/screenSupp57.pdf>, 4-7. Accession Date:17.10.2024
- [5] Hatim, B. & Munday, J. (2004). *Translation, an advanced resource book*. Routledge (Taylor & Francis Group), London and New York.
- [6] Hutchins, J. (2001). MT and human translation in competition or in complementation?. *International journal of translation*, 13(1-2), 5- 20. <https://vetrehberi.com/koyunlarda-babesiosis-agrimasi-piroplasmosis/> Accession Date: 04.01.2024.
- [7] Jimenez-Crespo, Miguel A. (2013). *Translation and web localization*. Routledge, London and New York.
- [8] León, F. C., Díez, G., Ferri, F. R., León Vizcaíno, L., Gijón, F.J, Gimeno, E.J., Cein, C.Z., Rodríguez, J.M.S.V., Madrigal, J.J.C., Cantos Gómez, P., Schudel, A. (2015). The translation into Spanish of the OIE Manual of diagnostic tests and vaccines for terrestrial animals (mammals, birds and bees): problems, solutions and conclusions. *Rev sci tech*, 24(3), 1095-104.
- [9] Moneus, A.M. & Sahari, Y. (2024). Artificial intelligence and human translation: a contrastive study based on legal texts. *Heliyon* 10(2024), 1-14.
- [10] Munday, J, Pinto, S. R. & Blakesley, J. (2022). *Introducing translation studies: theories and applications* (5th Edition). Routledge, London, and New York.
- [11] Newmark, P. (1979). A layman’s view of medical translation. *British medical journal*, 2(6202), 1405–1407.
- [12] Noriega-Santiáñez, L. & Corpas Pastor G. (2023). Machine vs human translation of formal neologisms in literature: exploring e-tools and creativity in students. *Revista tradumática. technologies de la traducció*, 21, 233-264.
- [13] Odacıoğlu, M. C. (2017). *Çeviribilimde yerelleştirme paradigmasına doğru* [Towards a Localization Paradigm]. Gece Kitaplığı, Ankara.
- [14] Reiss, K. & Vermeer, Hans J. (1984, 2013), *Grundlegung einer allgemeinen Translationstheorie* [Towards a general theory of translation: Skopos theories explained] (translated by Christiane Nord). Routledge, London and New York.
- [15] Romero, A. (2013). Veterinary translation: an undiscovered speciality in the health sciences. *Panacea-boletín de medicina y traducción*, 14(37), 56-65.
- [16] Schulz, S., Bernhardt-Melischig, J., Kreuzthaler, M., Daumke, P., Boeker, M. (2013). Machine vs. human translation of SNOMED CT terms. *Med info*, 581-584.
- [17] Sokolova, N.V. (2021). Machine vs human translation in the synergetic translation space. *Science journal of volsU. Linguistics*, 20(6), 89-98.
- [18] Tosun, M. (2002). *Dil edincini aşan bir edim olarak çeviri eylemi: Çeviri kuramlarının gelişiminde paradigma değişimi* [English: Translation action as a performance that transcends language acquisition: A paradigm shift in the development of translation theories] (Unpublished PhD Thesis). Institute of Social Sciences, Sakarya University.
- [19] Toury, G. (1995). *Descriptive translation studies and beyond*. John Benjamins Publishing Company, Amsterdam and Philadelphia.
- [20] Venuti, L. (1994). *Translator’s invisibility: a history of translation*. Routledge, London and New York.

**Mehmet Cem Odacıoğlu** is currently serving as an Associate Professor in the department of Translation & Interpreting at Bartın University. His research interests include translation theories, technical and medical translation, translation technologies, AI in translation, and localization. Email: [cemodacioglu@bartin.edu.tr](mailto:cemodacioglu@bartin.edu.tr)

**Fadime Çoban** is a lecturer in the department of Translation & Interpreting at Bartın University. Her research interests include technical translation, translation technologies, AI in translation, translator psychology and interpreting.